FCC PART 15.249

TEST REPORT

For

Jiaxing Shufude Electric Bed Co., Ltd.

East No. 07 Provincial Road, Tengyun Village Wangjiangjing Development Zone, Jiaxing, Zhejiang, China

FCC ID: WKZCU358

Report Type:	**Product Type:**
Original Report	CONTROL BOX
Test Engineer:	Matt Yao
Report Number:	RKS160704004-00C
Report Date:	2016-07-07
Reviewed By:	Jesse Huang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) Chenghu Road,Kunshan Development Zone No.248,Kunshan, Jiangsu, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Jiaxing Shufude Electric Bed Co., Ltd.' s product, model number: CU358-4 (FCC ID: WKZCU358) (the "EUT") in this report was a CONTROL BOX, was measured approximately: 130 mm (L) x188mm (W) x 54mm (H), rated input voltage: DC18-32V.

All measurement and test data in this report was gathered from production sample serial number: 20160630005. (Assigned by BACL, Kunshan). The EUT was received on 2016-06-30.

Objective

This type approval report is prepared on behalf of Jiaxing Shufude Electric Bed Co., Ltd. in accordance with Part 2-Subpart J, and Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

N/A.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

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 December 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 in testing mode which was provided by manufacturer.

EUT was tested with Channel 2403MHz, 2442MHz and 2480MHz.

EUT Exercise Software

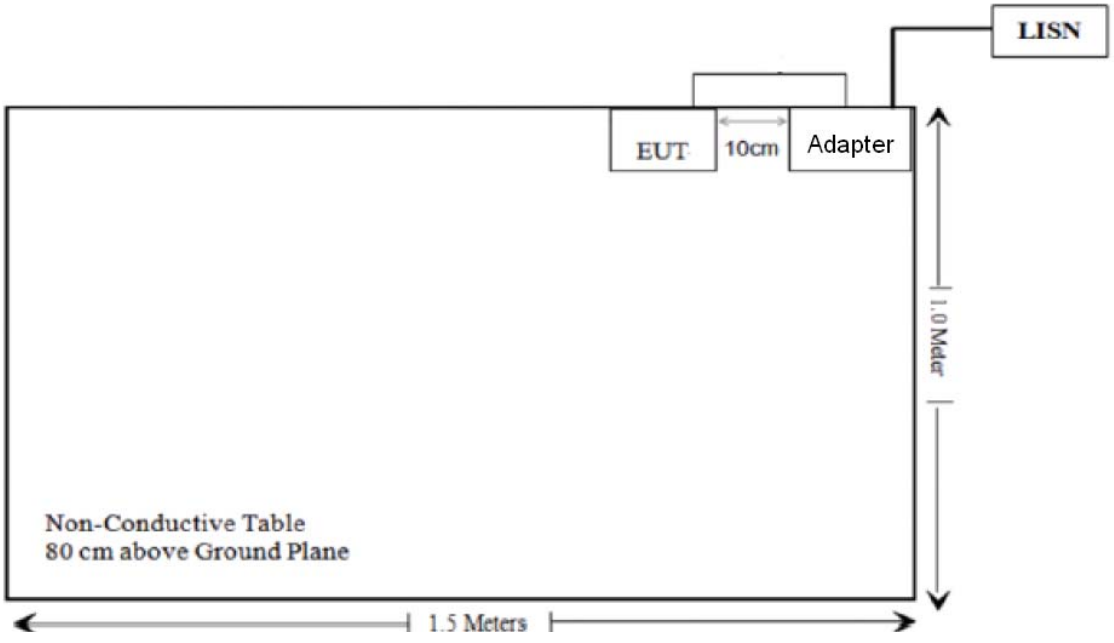
No software was used during the test.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
OKIN	AC/DC Switching Power Supply	SP2-A2	RBD456801513

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Compliance
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.249(d)	Out of Band Emission	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT has one integral antenna arrangement and antenna gain is 1dBi, which was permanently attached ,fulfill the requirement of this section, please refer to the EUT photos.

Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

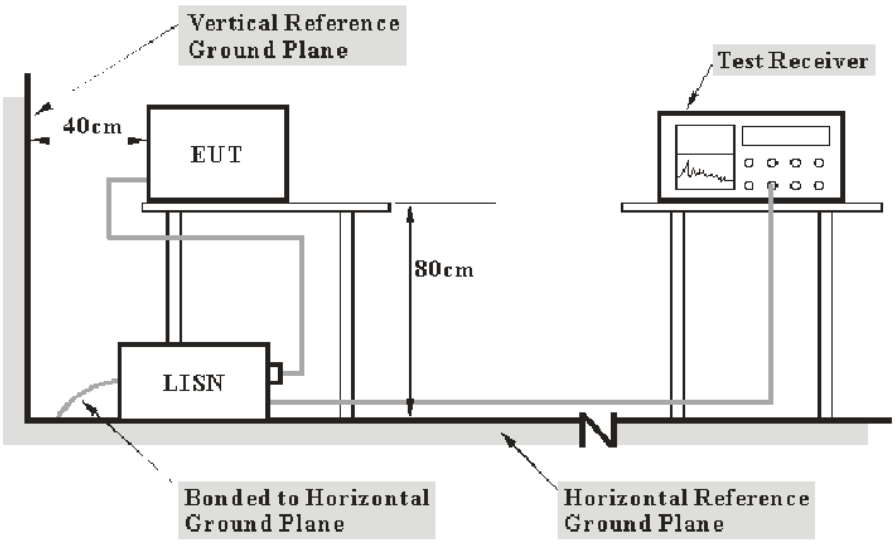
Measurement Uncertainty

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, 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 setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The adapter was connected to a 120 VAC/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 adapter was connected to the outlet of the 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	934115/007	2015-11-12	2016-11-11
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2015-11-12	2016-11-11
Rohde & Schwarz	LISN	ESH3-Z5	892239/018	2016-06-23	2017-06-22
Rohde & Schwarz	Pulse limiter	ESH3-Z2	879940/0058	2016-06-19	2017-06-18
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2015-10-01	2016-10-01
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 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, the worst margin reading as below:

11.63 dB at **0.545000 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2 and CISPR 16-4-1, 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

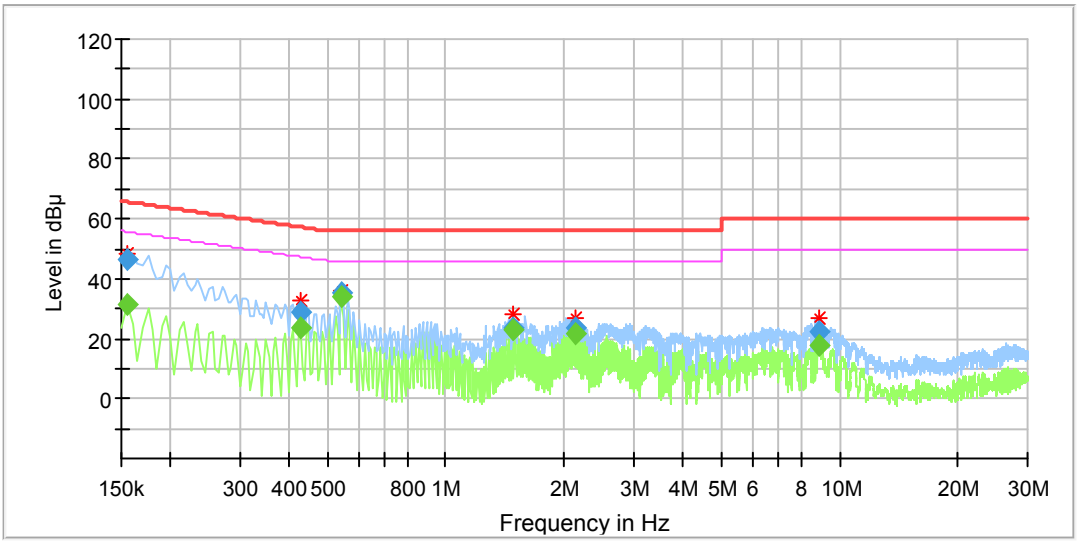
Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Matt Yao on 2016-07-06.

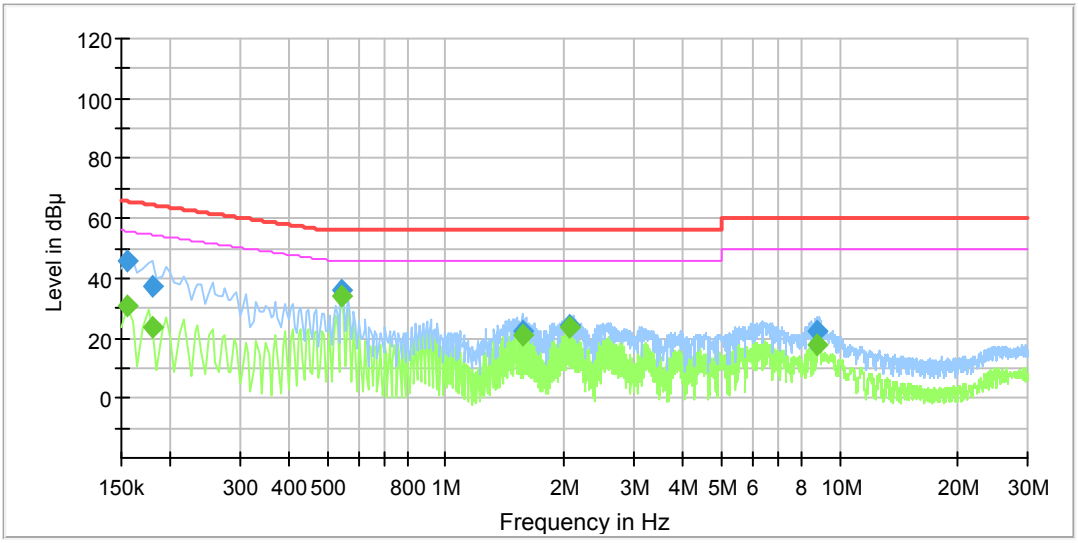
EUT operation mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.155000	---	31.12	9.000	L1	11.0	24.61	55.73	Compliance
0.155000	46.26	---	9.000	L1	11.0	19.47	65.73	Compliance
0.430000	---	23.49	9.000	L1	11.0	23.76	47.25	Compliance
0.430000	28.87	---	9.000	L1	11.0	28.38	57.25	Compliance
0.545000	---	34.11	9.000	L1	11.0	11.89	46.00	Compliance
0.545000	35.31	---	9.000	L1	11.0	20.69	56.00	Compliance
1.480000	---	23.26	9.000	L1	11.1	22.74	46.00	Compliance
1.480000	23.90	---	9.000	L1	11.1	32.10	56.00	Compliance
2.125000	---	21.99	9.000	L1	11.2	24.01	46.00	Compliance
2.125000	23.41	---	9.000	L1	11.2	32.59	56.00	Compliance
8.890000	---	17.91	9.000	L1	11.4	32.09	50.00	Compliance
8.890000	22.05	---	9.000	L1	11.4	37.95	60.00	Compliance

AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.155000	---	30.48	9.000	N	11.0	25.25	55.73	Compliance
0.155000	45.50	---	9.000	N	11.0	20.23	65.73	Compliance
0.180000	---	23.40	9.000	N	11.0	31.09	54.49	Compliance
0.180000	37.61	---	9.000	N	11.0	26.88	64.49	Compliance
0.545000	---	34.37	9.000	N	11.0	11.63	46.00	Compliance
0.545000	35.79	---	9.000	N	11.0	20.21	56.00	Compliance
1.560000	---	21.29	9.000	N	11.2	24.71	46.00	Compliance
1.560000	22.60	---	9.000	N	11.2	33.40	56.00	Compliance
2.065000	---	23.70	9.000	N	11.2	22.30	46.00	Compliance
2.065000	24.22	---	9.000	N	11.2	31.78	56.00	Compliance
8.770000	---	17.87	9.000	N	11.4	32.13	50.00	Compliance
8.770000	22.23	---	9.000	N	11.4	37.77	60.00	Compliance

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

FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS& OUT OF BAND EMISSION

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

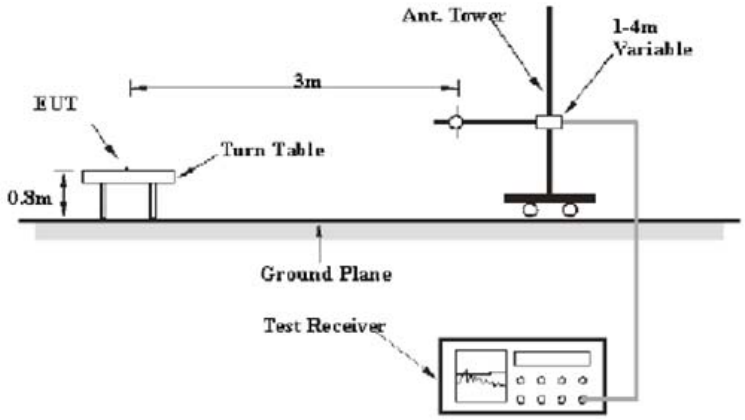
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Kunshan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

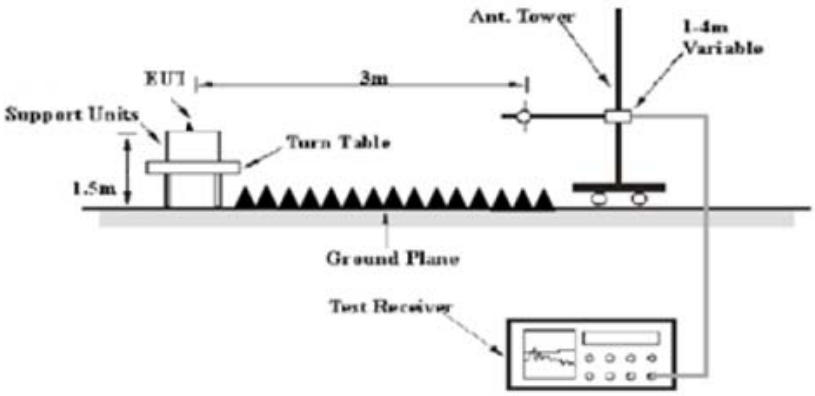
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were 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
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 detection mode from 30MHz to 1GHz, Peak and average detection mode above 1 GHz.

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

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:

Margin = Limit –Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrunent	Amplifier	330	171377	2015-09-16	2016-09-16
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2015-11-12	2016-11-11
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	2015-11-12	2016-11-11
Mini	Pre-amplifier	ZVA-183-S+	857001418	2015-09-16	2016-09-16
R&S	Auto test Software	EMC32	V 09.10.0	-	-
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-12-16	2016-12-15

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

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 &15.205 & 15.249, with the worst margin reading of:

1.29 dB at **2403MHz** in the **Vertical** polarization for Low Channel

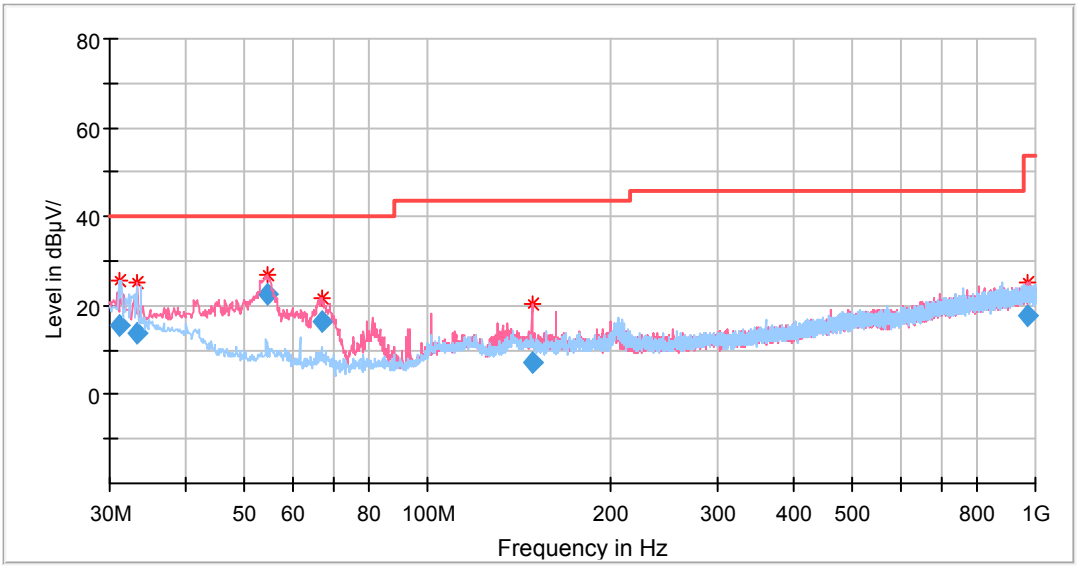
Test Data

Environmental Conditions

Temperature:	25.6°C
Relative Humidity:	52%
ATM Pressure:	101.2 kPa

The testing was performed by Matt Yao on 2016-07-04.

30MHz-1GHz:



Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.249/205/209	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dB µ	Margin (dB)
31.091250	21.51	QP	323.0	100.0	H	-5.8	15.71	40.00	24.29
33.273750	20.80	QP	52.0	100.0	V	-6.9	13.90	40.00	26.10
54.371250	39.22	QP	5.0	100.0	V	-16.7	22.52	40.00	17.48
67.102500	33.60	QP	217.0	100.0	V	-17.0	16.60	40.00	23.40
148.340000	19.47	QP	160.0	100.0	V	-12.2	7.27	43.50	36.23
970.293750	17.79	QP	48.0	100.0	V	0.1	17.89	53.90	36.01

Test Mode: Transmitting （Scan with X, Y, Z axis, the worst case is X axis ）

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2403 MHz)									
2403	94.62	PK	211.0	150.0	V	4.9	99.52	114	14.48
2403	87.81	Ave	211.0	150.0	V	4.9	92.71	94	1.29
2403	93.51	PK	306.0	150.0	H	4.9	98.41	114	15.59
2403	87.76	Ave	306.0	150.0	H	4.9	92.66	94	1.34
2401	44.29	PK	301.0	200.0	H	4.9	49.19	74	24.81
2401	41.70	Ave	301.0	200.0	H	4.9	46.60	54	7.40
2390	34.34	PK	115.0	150.0	V	4.9	39.24	74	34.76
2390	20.85	Ave	115.0	150.0	V	4.9	25.75	54	28.25
1210	33.45	PK	324.0	150.0	H	1.4	34.85	74	39.15
1210	20.49	Ave	324.0	150.0	H	1.4	21.89	54	32.11
4806	31.94	PK	75.0	150.0	H	13.3	45.24	74	28.76
4806	19.03	Ave	75.0	150.0	H	13.3	32.33	54	21.67
6667	35.89	PK	88.0	150.0	V	17.8	53.69	74	20.31
6667	22.44	Ave	88.0	150.0	V	17.8	40.24	54	13.76
6990	21.63	Ave	127.0	150.0	V	19.0	40.63	54	13.37
6990	35.40	PK	127.0	150.0	V	19.0	54.40	74	19.60
7209	16.69	Ave	0.0	200.0	H	19.7	36.39	54	17.61
7209	30.60	PK	0.0	200.0	H	19.7	50.30	74	23.70

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Middle Channel (2442MHz)									
2442	93.82	PK	0.0	150.0	V	4.9	98.72	114	15.28
2442	87.44	Ave	0.0	150.0	V	4.9	92.34	94	1.66
2442	93.12	PK	45.0	200.0	H	4.9	98.02	114	15.98
2442	87.63	Ave	45.0	200.0	H	4.9	92.53	94	1.47
2445	20.5	Ave	303.0	150.0	H	4.9	25.40	54	28.60
2445	33.28	PK	303.0	150.0	H	4.9	38.18	74	35.82
4884	32.69	PK	95.0	150.0	V	13.6	46.29	74	27.71
4884	19.05	Ave	95.0	150.0	V	13.6	32.65	54	21.35
6667	22.44	Ave	311.0	150.0	H	17.8	40.24	54	13.76
6667	35.24	PK	311.0	150.0	H	17.8	53.04	74	20.96
6976	35.18	PK	194.0	150.0	V	18.9	54.08	74	19.92
6976	21.69	Ave	194.0	150.0	V	18.9	40.59	54	13.41
7326	31.22	PK	92.0	200.0	H	20.0	51.22	74	22.78
7326	17.39	Ave	92.0	200.0	H	20.0	37.39	54	16.61

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2480MHz)									
2480	91.67	PK	11.0	150.0	V	5.0	96.67	114	17.33
2480	86.23	Ave	11.0	150.0	V	5.0	91.23	94	2.77
2480	92.39	PK	310.0	200.0	H	5.0	97.39	114	16.61
2480	86.75	Ave	310.0	200.0	H	5.0	91.75	94	2.25
2485	38.40	PK	245.0	150.0	V	5.0	43.40	74	30.60
2485	34.77	Ave	245.0	150.0	V	5.0	39.77	54	14.23
2483.5	35.94	Ave	256.0	150.0	V	5.0	40.94	54	13.06
2483.5	41.95	PK	256.0	150.0	V	5.0	46.95	74	27.05
4960	31.83	PK	259.0	150.0	H	13.9	45.73	74	28.27
4960	18.48	Ave	259.0	150.0	H	13.9	32.38	54	21.62
6948	21.30	Ave	223.0	150.0	V	18.8	40.10	54	13.90
6948	34.42	PK	223.0	150.0	V	18.8	53.22	74	20.78
7440	32.93	PK	348.0	200.0	H	20.4	53.33	74	20.67
7440	22.72	Ave	348.0	200.0	H	20.4	43.12	54	10.88

FCC §15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2015-09-02	2016-09-02
Dressler	Attenuator	ATT 6/75	510020010004	2015-11-12	2016-11-12
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-12-15	2016-12-15

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

Test Data

Environmental Conditions

Temperature:	25.6°C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

** The testing was performed by Matt Yao on 2016-07-02.*

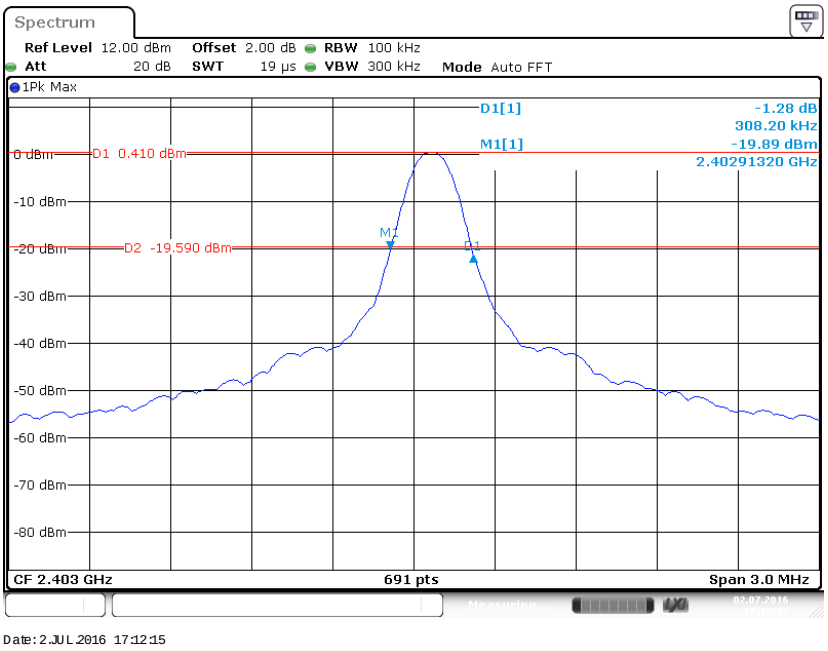
Test Result: Compliant.

Please refer to following tables and plots

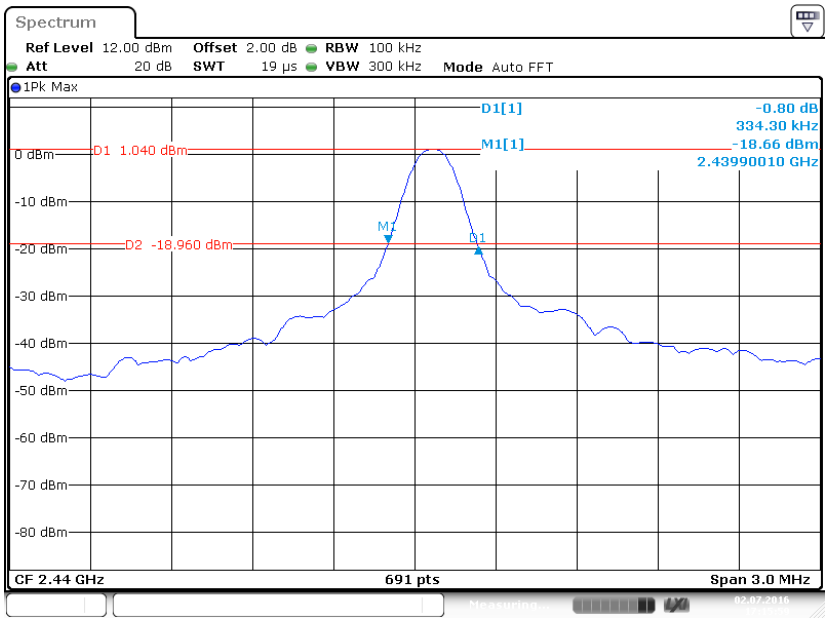
Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (KHz)
Low	2403	308.20
Middle	2440	334.30
High	2480	303.90

Low Channel

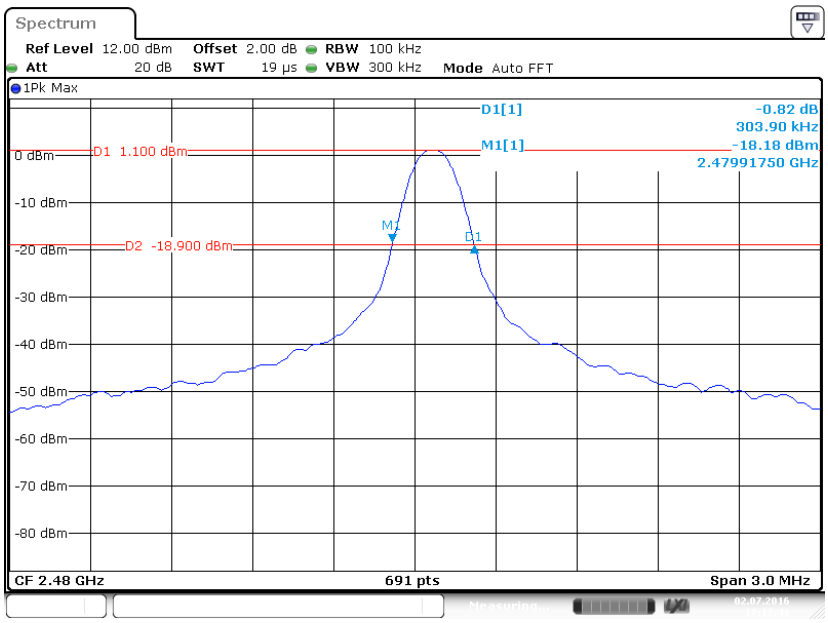


Middle Channel



Date: 2.JUL.2016 17:16:30

High Channel



Date: 2.JUL.2016 17:17:43

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