

FCC PART 15.249


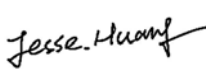
TEST REPORT


For

JIAXING SHUFUDE ELECTRIC BED CO., LTD.

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

FCC ID: WKZSFDY1007

Report Type: Original Report		Product Type: Remote Control	
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Report Number:	RKS150216002-00A		
Report Date:	2015-02-17		
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Applicant's product, model number: SFD-Y-10-7S (FCC ID: WKZSFDY1007) (the "EUT") in this report was a Remote Control, was measured approximately: 15.0 cm (L) x 6.0 cm (W) x 1.5cm (T), rated input voltage: DC 1.5V*3 AA battery.

Note: The series product model name: SFD-Y-10-7S, SFD-Y-10-2E and SFD-Y-10-7E, They have the same hardware, PCB layout ,antenna and component , the different is printing on the key , and it does not affect the RF power and parameter.

All measurement and test data in this report was gathered from production sample serial number: 20150210. (Assigned by BACL, Kunshan). The EUT was received on 2015-02-10.

Objective

This type approval report is prepared on behalf of *Applicant* 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, 15.207, 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 C63.4-2009, 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 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 C63.4-2009.

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 engineering mode, which was provided by the manufacturer. The engineering mode was configured under maximum power output and switched the channels by key.

60 channels were provided by the manufacturer:

Operation Frequency: 2402.399 MHz – 2437.79 MHz

The above frequencies can be set through the 6-dip SW
on the back of the Remote Control

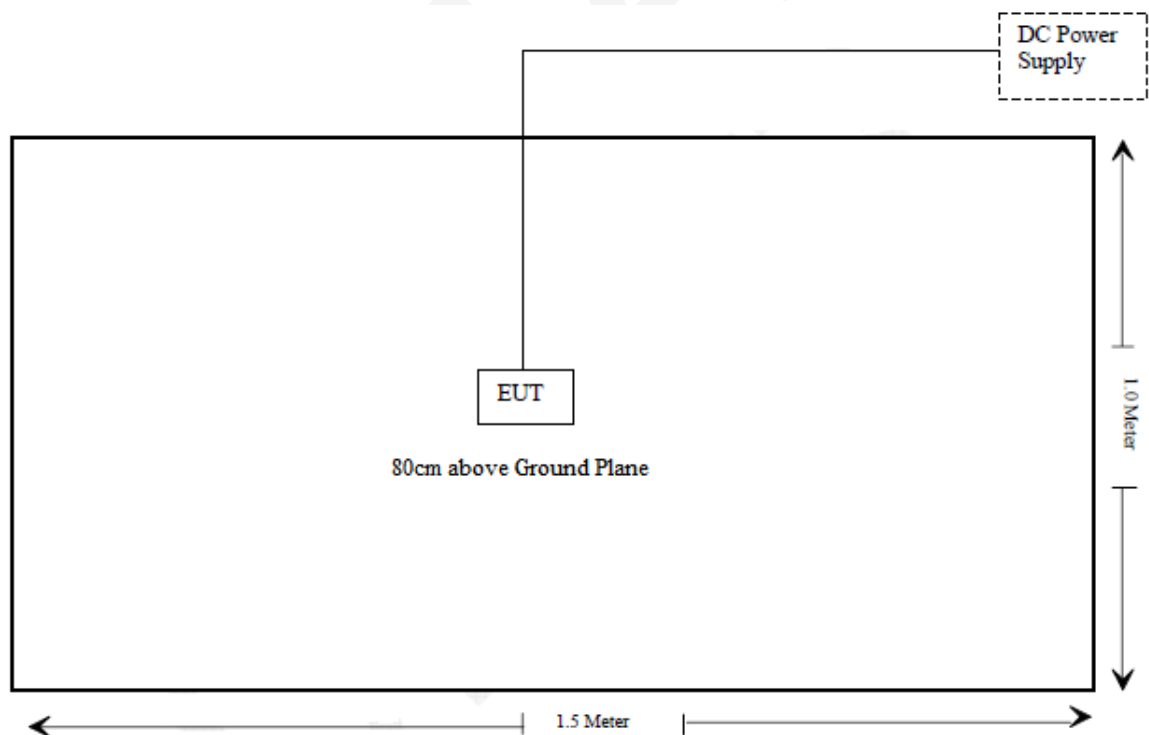
$f = (26/216) * (6049476 + i * 3 * 504) \text{ MHz}$
where $i = 4, 5, 6, \dots, 63$ adjust through the 6-dip SW

EUT was tested with Channel 2402.399MHz, 2419.195MHz and 2437.79MHz.

EUT Exercise Software

No software was used during the test.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Not Applicable
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.249(d)	Out of Band Emission	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

Not Applicable: The EUT is battery operated equipment.

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 5.3dBi, which was permanently attached ,fulfill the requirement of this section, please refer to the EUT photos.

Result: Compliant.

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

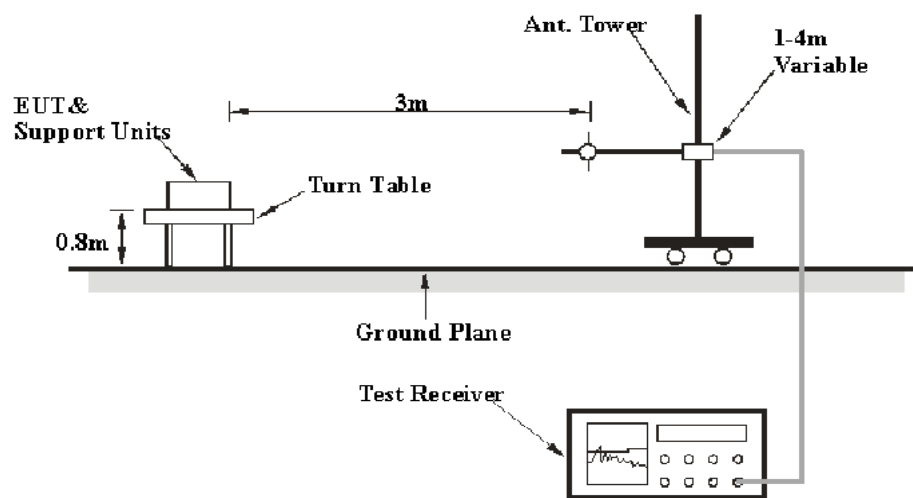
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

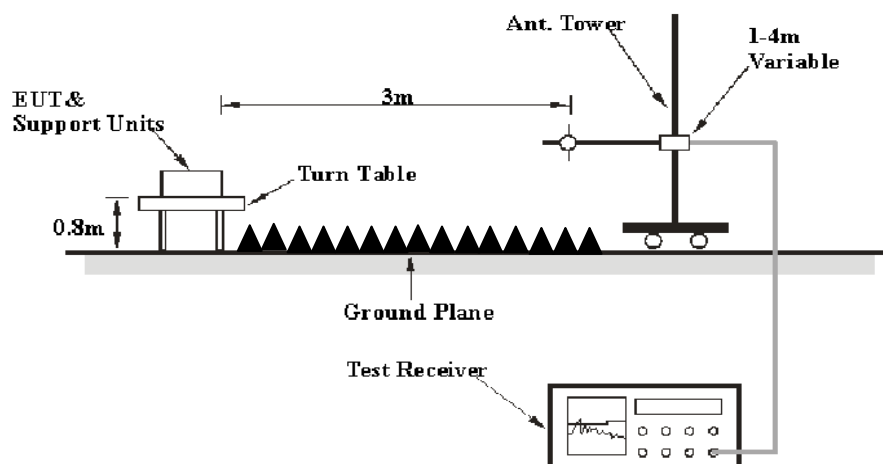
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2003. 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:

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

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 7dB 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
Sonoma Instrument	Amplifier	330	171377	2014-09-16	2015-09-16
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2014-09-16	2015-09-16
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2014-09-12	2015-09-12
ETS	Horn Antenna	3115	6229	2014-09-12	2015-09-12
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2014-09-16	2015-09-16
Mini	Pre-amplifier	ZVA-183-S+	857001418	2014-09-16	2015-09-16
champrotek	Chamber	Chamber A	1#	2014-09-17	2015-09-17
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, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

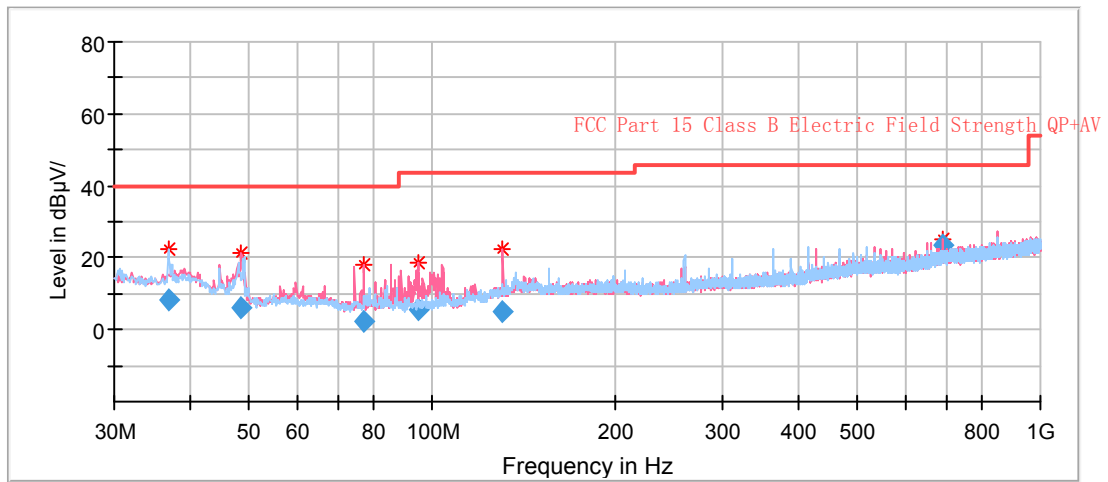
According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.205 & 15.249, with the worst margin reading of:

3.86 dB at 2437.8 MHz in the Horizontal polarization

Test Data**Environmental Conditions**

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

The testing was performed by Matt Yao on 2015-02-15.

30MHz-1GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμ)	Margin (dB)
36.790000	18.44	QP	191.0	99.0	H	-10.3	8.14	40.00	31.86
48.551250	21.5	QP	145.0	99.0	V	-15.6	5.90	40.00	34.10
77.166250	19.36	QP	154.0	201.0	V	-17.1	2.26	40.00	37.74
94.990000	22.47	QP	101.0	99.0	V	-17.0	5.47	43.50	38.03
130.758750	18.15	QP	208.0	99.0	V	-13.2	4.95	43.50	38.55
688.993750	25.89	QP	202.0	99.0	V	-2.6	23.29	46.00	22.71

Test Mode: Transmitting

Frequency (MHz)	Receiver		Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Height (cm)	Polar (H/V)				
Low Channel								
2390.000120	60.64	PK	148.0	H	3.0	63.64	73.90	10.26
2390.0020120	26.28	AVE	148.0	H	3.0	29.28	53.90	24.62
2402.404810	87.01	PK	99.0	V	3.0	90.01	113.90	23.89
2402.404810	84.02	AVE	99.0	V	3.0	87.02	93.90	6.88
4805.104700	52.28	PK	99.0	V	11.6	63.88	73.90	10.02
4805.104700	35.56	AVE	99.0	V	11.6	47.16	53.90	6.74
7210.474010	45.06	PK	145.0	V	17.3	62.36	73.90	11.54
7210.474010	30.91	AVE	145.0	V	17.3	48.21	53.90	5.69
Middle Channel								
2419.201470	89.75	PK	99.0	V	3.1	92.85	113.90	21.05
2419.201470	84.93	AVE	99.0	V	3.1	88.03	93.90	5.87
4838.471020	52.42	PK	99.0	V	11.6	64.02	73.90	9.88
4838.471020	36.06	AVE	99.0	V	11.6	47.66	53.90	6.24
7257.257100	45.66	PK	140.0	V	17.4	63.06	73.90	10.84
7257.257100	30.73	AVE	140.0	V	17.4	48.13	53.90	5.77
High Channel								
2437.835671	91.29	PK	149.0	H	3.1	94.39	113.90	19.51
2437.835671	86.94	AVE	149.0	H	3.1	90.04	93.90	3.86
2483.500204	42.57	PK	179.0	H	3.2	45.77	73.90	28.13
2483.500204	22.05	AVE	179.0	H	3.2	25.25	53.90	28.65
4874.645100	52.43	PK	99.0	V	11.7	64.13	73.90	9.77
4874.645100	35.94	AVE	99.0	V	11.7	47.64	53.90	6.26
7314.017470	45.95	PK	149.0	V	17.5	63.45	73.90	10.45
7314.017470	30.97	AVE	149.0	V	17.5	48.47	53.90	5.43

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	FSIQ26	100048	2014-09-16	2015-09-16

* **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 2015-02-15.

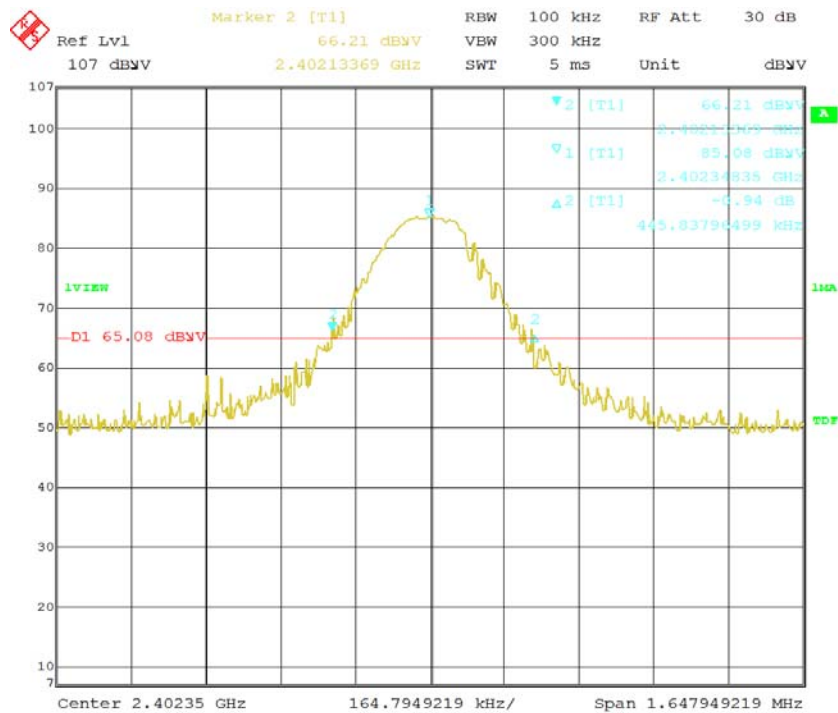
Test Result: Compliant.

Please refer to following tables and plots

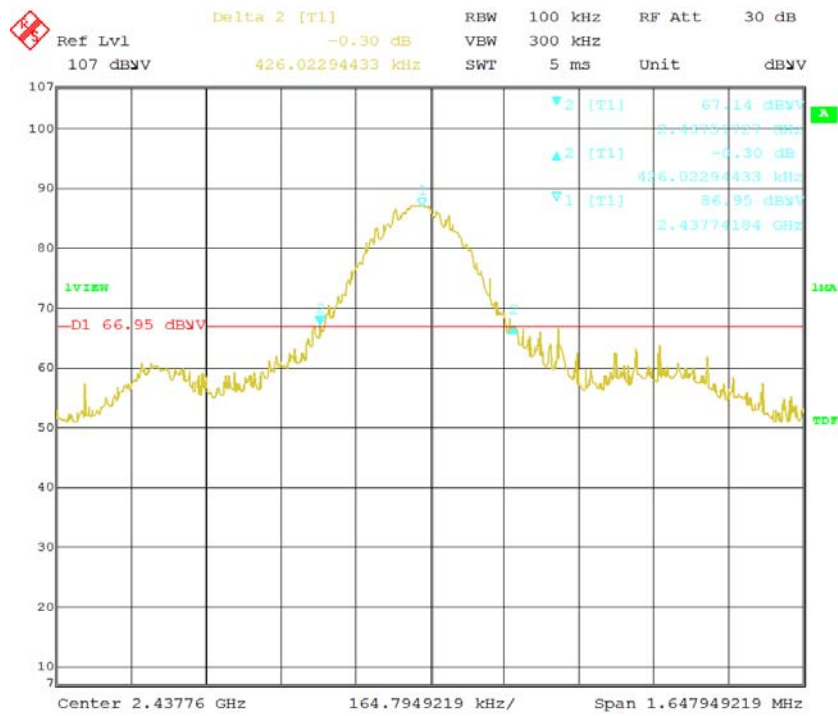
Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402.399	0.446
Middle	2419.195	0.426
High	2437.790	0.452

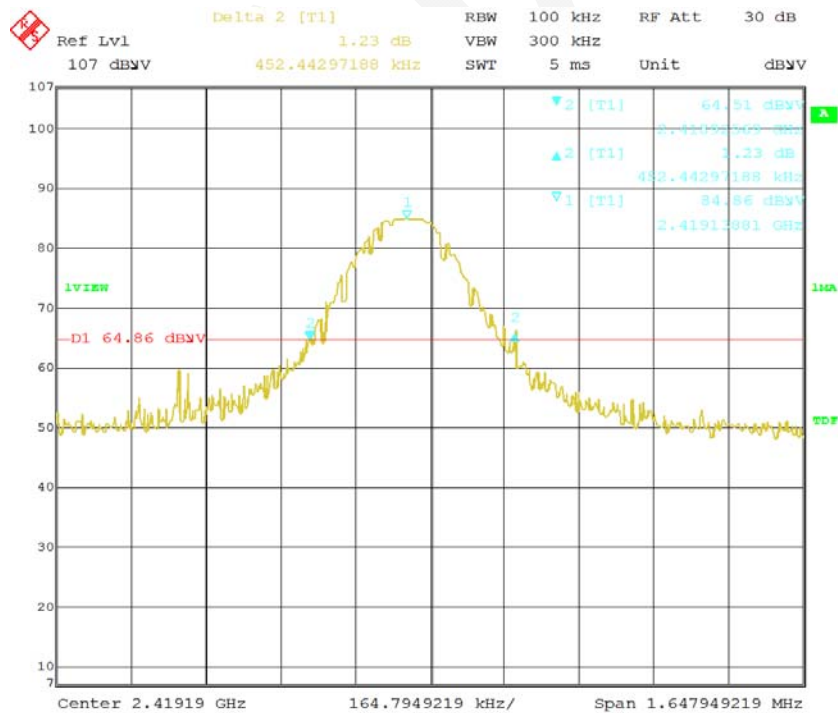
Low Channel



Middle Channel



High Channel



Declaration of Series Product

Date: 2015-2-12

To Whom It May Concern,

We, Jiaxing Shufude Electric Bed Co., Ltd. here by declare that our product series: SFD-Y-10-7S, SFD-Y-10-2E and SFD-Y-10-7E are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics. They are certified by BACL.

The series product model name: SFD-Y-10-7S, SFD-Y-10-2E and SFD-Y-10-7E, They have the same hardware, PCB layout, antenna and component, the different is printing on the key, and it does not affect the RF power and parameter.

Please contact me if you have any question.

Signature:

Jinhua Xu

Manager

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