




FCC PART 15.231  
EMI MEASUREMENT AND TEST REPORT  
For

**Banda Star Industrial Limited**

Unit A,9/F.,Phase1.Leader Industrial Centre.188-202 Texaco Road, Tsuen Wan, N.T., Hongkong

**FCC ID: XAU19330**

Apr. 15, 2009

This Report Concerns: Original Report	Equipment Type : Wireless Door Chime
Test Engineer: <u>Eric Li</u> 	
Report No.: <u>F09041201A</u>	
Receive EUT Date/Test Date: <u>Apr.10,2009/ Apr.10-15,2009</u>	
Reviewed By: <u>Christina</u> 	
Prepared By:	 <b>Shenzhen BST Technology Co.,Ltd.</b> 3F,Weames Technology Building, No. 10 Kefa Road,Science Park, Nanshan District,Shenzhen,Guangdong,China Tel: 0755-26747751 ~ 3 Fax: 0755-26747751 ~ 3 ext.826

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## **1. GENERAL INFORMATION**

### **1.1. Report information**

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BST approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BST in any way guarantees the later performance of the product/equipment.

1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BST therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BST, unless the applicant has authorized BST in writing to do so.

Test Facility -

The test site used to collect the radiated data is located on the address of Solid Industrial Co., Ltd. (FCC Registered Test Site Number: 759397) on 333 Bulong Highway Buji, Longgang Shenzhen, Guangdong, China

The Test Site is constructed and calibrated to meet the FCC requirements.

### **1.2. Measurement Uncertainty**

Available upon request.

## 2. PRODUCT DESCRIPTION

### 2.1. EUT Description

Description : Wireless Door Chime

Applicant : Banda Star Industrial Limited  
Unit A, 9/F., Phase1.Leader Industrial Centre.188-202  
Texaco Road, Tsuen Wan, N.T., Hongkong

Model Number : 19330, 19331, 19332, 19333, 19334, 19335, 19336,  
19337

#### **Additonal Information**

Frequency : 433.93MHz

Power Supply : DC12V ( Supplied by battery )

Maximum : N/A

Range

Transmitter : -

Antenna

Current : N/A

Consumption

### 2.2. Block Diagram of EUT Configuration



### 2.3. Support Equipment List

1.	--	----
2.	--	-----
3.	--	-----

### 2.4. Test Conditions

Temperature: 23~25

Relative Humidity: 55~63 %

### 3. FCC ID LABEL

**FCC ID: XAU19330**

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:**

- 1. This device may not cause harmful interference, and**
- 2. This device must accept any interference received, including interference that may cause undesired operation.**

#### **Label Location on EUT**

#### **EUT Bottom View/ FCC ID Label Location**



#### 4. TEST RESULTS SUMMARY

##### FCC 15 Subpart C, Paragraph 15.231

Test Standards	Test Items	Test Results
	Conducted test	N/A
§15.231 (b)	Radiated Emission	Pass
§15.231 (c)	20dB Band Width Testing	Pass
§15.231 (a)	Deactivation Testing	Pass

Remark: “N/A” means “Not applicable.”

##### Modifications

No modification was made.

## 5. TEST EQUIPMENT USED

Equipment/Facilities	Manufacturer	Model #	Serial no.	Date of Cal.	Cal. Interval
Cable	Resenberger	N/A	NO.1	Mar 10 , 2009	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Mar 10 , 2009	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Mar 10 , 2009	1 Year
LISN	Rohde & Schwarz	ESH3-Z5	100305	Mar 10 , 2009	1 Year
50 Coaxial Switch	ANRITSU CORP	MP59B	6200283933	Mar 10, 2009	1 Year
EMI Test Receiver	Rohde & Schwarz	ESP13	100180	Oct.18,2008	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSP40	100273	Sep.10,2008	1 Year
3m Semi-Anechoic Chamber	Albatross Projects	9mx6mx6m	N/A	Feb.20,2009	1 Year
Signal Generator	FLUKE	PM5418 + Y/C	LO747012	Feb.20,2009	1 Year
Signal Generator	FLUKE	PM5418TX	LO738007	Feb.20,2009	1 Year
Loop Antenna	SCHWARZBECK	FMZB1516	113	Jan.30,2009	1 Year
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4079	Sep.22,2008	1 Year
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-564	Sep.22,2008	1 Year
Ultra Broadband Antenna	Rohde & Schwarz	HL-562	100110	June.15,2008	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100196	Oct.11,2008	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100197	Oct.11,2008	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
Power Meter	Rohde & Schwarz	NRVD	100041	Feb.20,2009	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Feb.20,2009	1 Year
Coaxial Cable with N-connectors	SCHWARZBECK	AK9515H	95549	Sep.22,2008	1 Year
Radio Communication Test Set	Rohde & Schwarz	CMS 54	846621/024	Feb.20,2009	1 Year
Modulation Analyzer	Hewlett-Packard	8901B	2303A00362	Feb.20,2009	1 Year
Absorbing clamp	Rohde & Schwarz	MDS-21	N/A	Oct.29,2008	1 Year

## 6. CONDUCTED POWER LINE TEST

### 6.1. Test Equipment

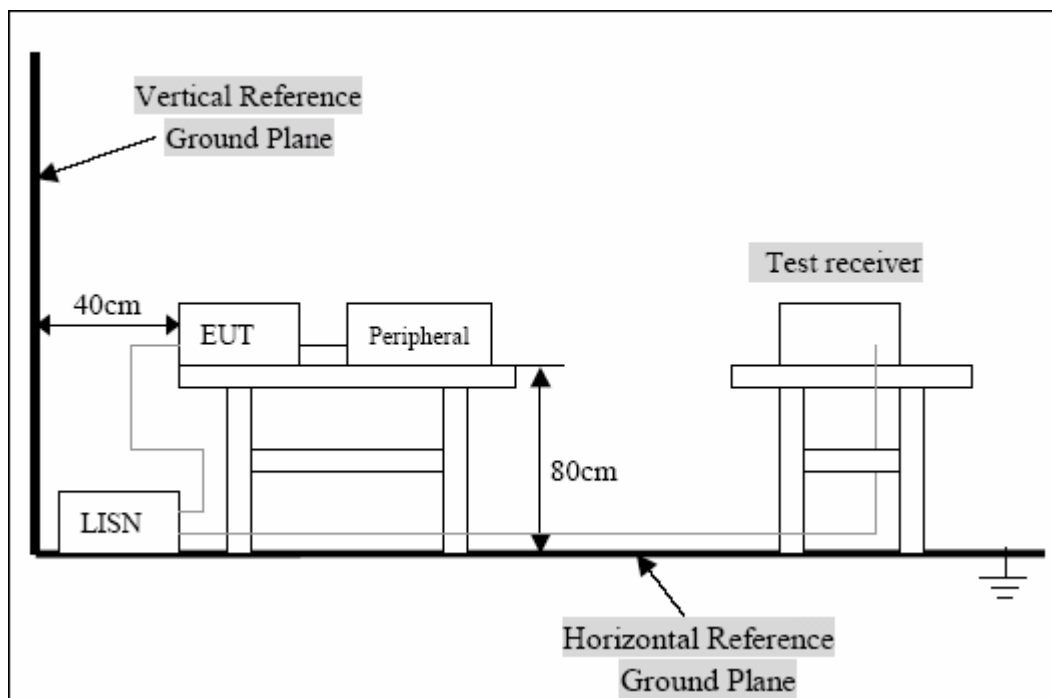
Please refer to section 4 this report.

### 6.2. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uh coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uh coupling impedance with 50ohm termination.

Both sides of A.C. Line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ASIN C63.4:2003 on conducted measurement. Conducted emissions were measured over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9KHz.

### 6.3. Test Setup



For the actual test configuration, Please refer to the related items-Photos of testing

### 6.4. Configuring of the EUT

The EUT was configured according to ASIN C63.4:4-2003. Enable the signal transmitted from the external antenna from EUT to receiver. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

Note:

Below 1GHZ, the channel low, middle, high were pre-tested, The channel low, worst case one, was chosen for conducted and radiated emission test.

Above 1GHZ, the channel low, middle, high were tested individually.



## A.EUT

Device	Manufacturer	Model #	FCC ID
WIRELESS DOOR CHIME	BANDA STAR INDUSTRIAL LIMITED	19330, 19331, 19332, 19333, 19334, 19335, 19336, 19337	XAU19330

## B.Internal Devices

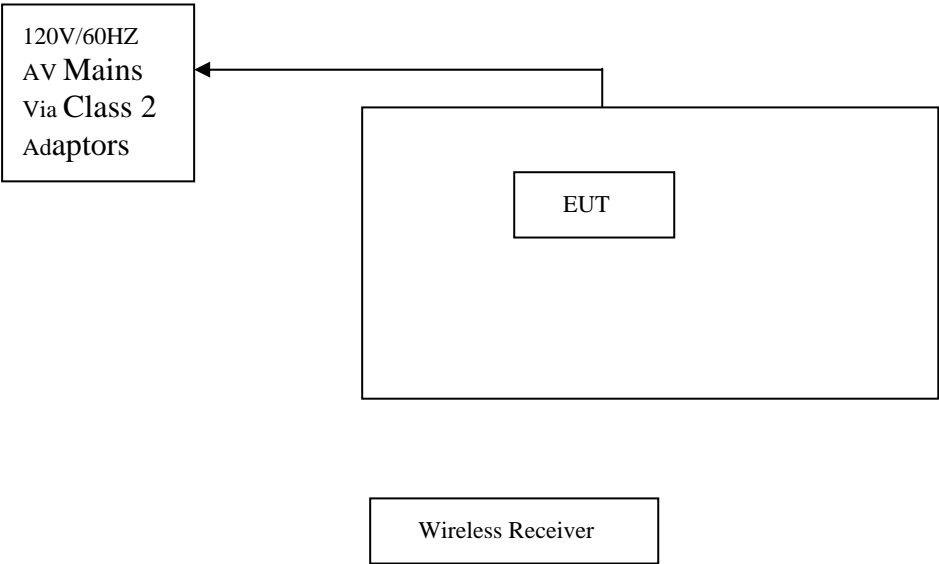
Device	Manufacturer	Model #	FCC ID
N/A			

## C.Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/Doc	Cable
N/A				

6.5. EUT Operating Condition

Operating condition is according to ANSI C63.4-2003.  
Setup the EUT and simulators as shown on follow.  
Enable RF signal and confirm EUT active.  
Modulate output capacity of EUT up to specification.



6.6. Conducted Power line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuv)		
Frequency Range (MHZ)	Class A QP/AV	Class B QP/AV
0.15-0.5	79/66	65-56/56-46
0.5-5.0	73/60	56/46
5.0-30	73/60	60/50

**Note:** In the above table, the tighter limit applies at the band edges.

6.7. Conducted Power Line Test Result

N/A

## 7. RADIATION EMISSIONS

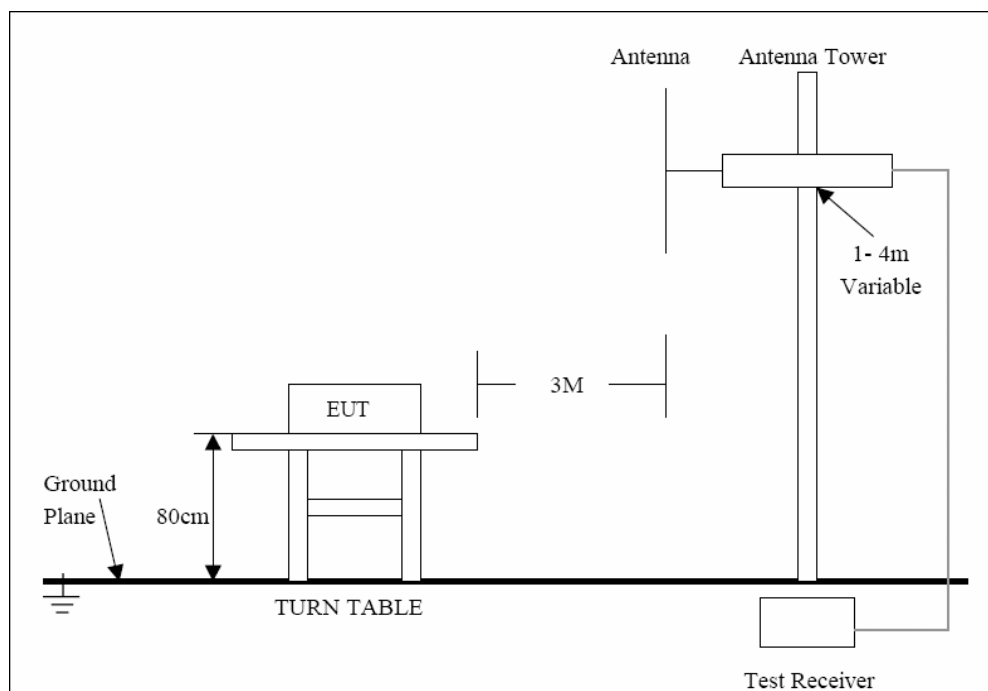
### 7.1. Test Equipment

Please refer to section 4 this report.

### 7.2. Test Procedure

The emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part Subpart C limits. through three orthogonal axes to determine which attitude and equipment arrangement produces the highest emission relative to the limit.

### 7.3. Radiated Test Setup



Setup below 3mMHz, refer to 7.3; For the accrual test configuration, please refer to the related items-photos of Testing.

### 7.4. Radiated Emission Limit

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250.....	225
70-130.....	1,250.....	125
130-174.....	1,250 to 3,370.....	125 to 375
174-260.....	3,750	375
260-470.....	3,750 to 12,500.....	375 to 1,250
Above 470	12,500.....	1,250

Linear interpolations for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

## 7.5. Radiated Emission Test Result

Temperature: 25

Humidity: 56%RH

Test Result: PASS

Frequency (MHz)	Antenna Polarization	Emission Level (PK)(dBuV/m)	FCC 15 Subpart C Limit (AV)(dBuV/m)
433.93	V	64.40	80.8
433.93	H	60.22	80.8
867.86	V	44.43	60.8
867.86	H	42.22	60.8
1301.79	V	42.53	54
1301.79	H	41.54	54
1735.72	V	40.25	60.8
1735.72	H	39.25	60.8
2169.65	V	-----	60.8
2169.65	H	-----	60.8
2603.58	V	-----	60.8
2603.58	H	-----	60.8
3037.51	V	-----	60.8
3037.51	H	-----	60.8
3471.44	V	-----	60.8
3471.44	H	-----	60.8
3905.37	V	-----	54
3905.37	H	-----	54
4339.3	V	-----	54
4339.3	H	-----	54

Note:

-----means the emission is too low, more than 20dB from the limit.

## 8. 20B BANDWIDTH

### 8.1. Test Equipment

Please refer to Section 4 this report.

### 8.2. Test Procedure

1. The EUT was tested according C63.4-2003.The radiated test was performed at FCC Registration laboratory.
2. With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

### 8.3. FCC 15.231(c) 20B Bandwidth Limit

Per 15.231( c ) ,The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

### 8.4. Test Result

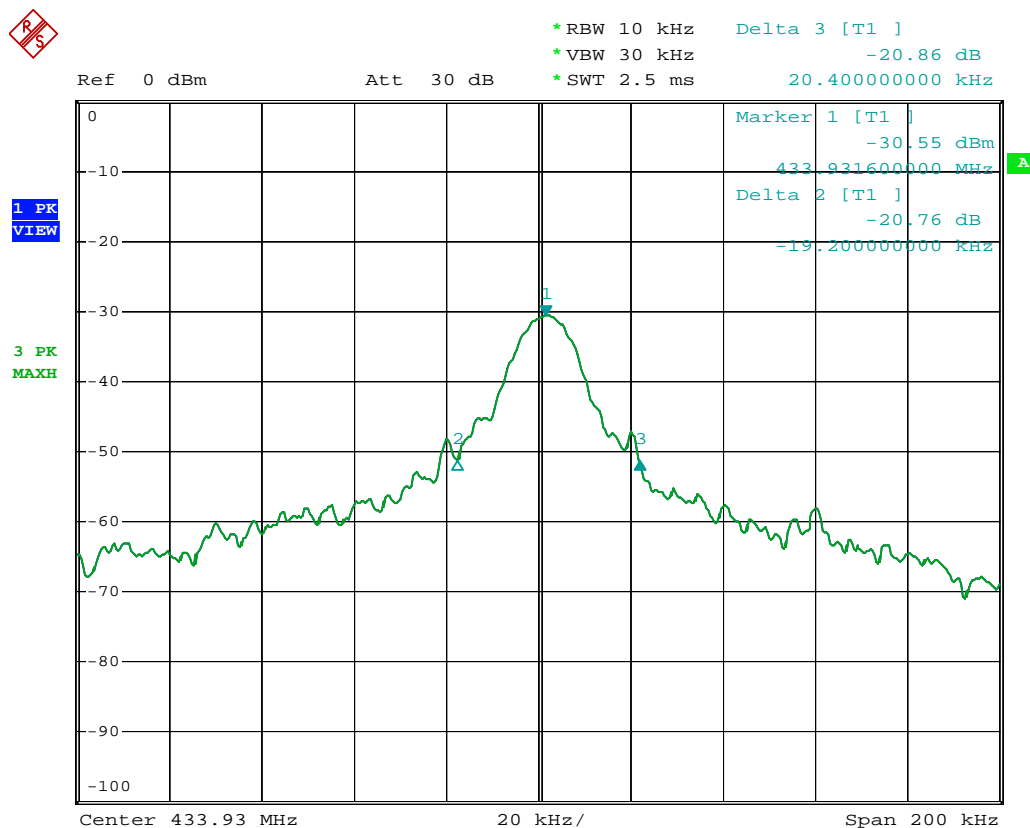
Temperature: 25

Humidity: 56%RH

Limit=Frequency $\times$ 0.25%=433.9316 $\times$ 0.25%=1084.829 kHz

Test data: 42.8KHz

Test Result: PASS



Date: 15.APR.2009 15:55:28

## 9. DEACTIVATION TESTING

### 9.1. Test Equipment

Please refer to Section 4 this report.

### 9.2. Test Procedure

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

### 9.3. Deactivation Requirement

Per 15.231( a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### 9.4. Test Result

Temperature: 25

Humidity: 56%RH

*THE TRANSMITTER TRANSMITTING TIME NOT MORE THAN 5 SECONDS*

Test Result: PASS

