

**FCC PART 15 CLASS B  
MEASUREMENT AND TEST REPORT**

For

**Shunde Advante Electron Ltd.**

North Second XinXi Road, LunJiao Industrial Avenue LunJiao, Shunde, Foshan, Guangdong,  
China

**FCC ID: Q2I120529**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Wireless Doorchime Receiver
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 \* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

## TABLE OF CONTENTS

<b>GENERAL INFORMATION.....</b>	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST FACILITY .....	3
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>4</b>
DESCRIPTION OF TEST CONFIGURATION .....	4
EQUIPMENT MODIFICATIONS .....	4
SUPPORT EQUIPMENT LIST AND DETAILS .....	4
BLOCK DIAGRAM OF TEST SETUP .....	4
<b>SUMMARY OF TEST RESULTS .....</b>	<b>5</b>
<b>FCC §15.107 – AC LINE CONDUCTED EMISSIONS.....</b>	<b>6</b>
MEASUREMENT UNCERTAINTY .....	6
EUT SETUP .....	6
EMI TEST RECEIVER SETUP.....	7
TEST EQUIPMENT LIST AND DETAILS.....	7
TEST PROCEDURE .....	7
TEST RESULTS SUMMARY .....	7
TEST DATA .....	7
<b>FCC §15.109 - RADIATED EMISSIONS .....</b>	<b>10</b>
MEASUREMENT UNCERTAINTY .....	10
EUT SETUP .....	10
EMI TEST RECEIVER SETUP.....	11
TEST PROCEDURE .....	11
TEST EQUIPMENT LIST AND DETAILS.....	11
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	11
TEST RESULTS SUMMARY .....	11
TEST DATA .....	12
<b>DECLARATION LETTER.....</b>	<b>14</b>

## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Shunde Advante Electron Ltd.*'s product, model number: 688, 688-E, 688-UK (FCC ID: Q21120529) (the "EUT") in this report was a *Wireless Doorchime Receiver*, which was measured approximately:9.5cm (L) x 5.5cm (W) x 2.3cm (H), rated input voltage: AC 120V/60Hz

*Note: The series product, model 688, 688-E, 688-UK are electrically identical, and the difference between them please refers to the attached declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 120528005(Assigned by Applicant). The EUT was received on 2012-05-29.*

### Objective

This report is prepared on behalf of *Shunde Advante Electron Ltd.* in accordance with Part 2- Subpart J, 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)

No related submittal grant.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a receiving mode which is provided by manufacture. The highest working frequency is 433.92MHz in the test mode.

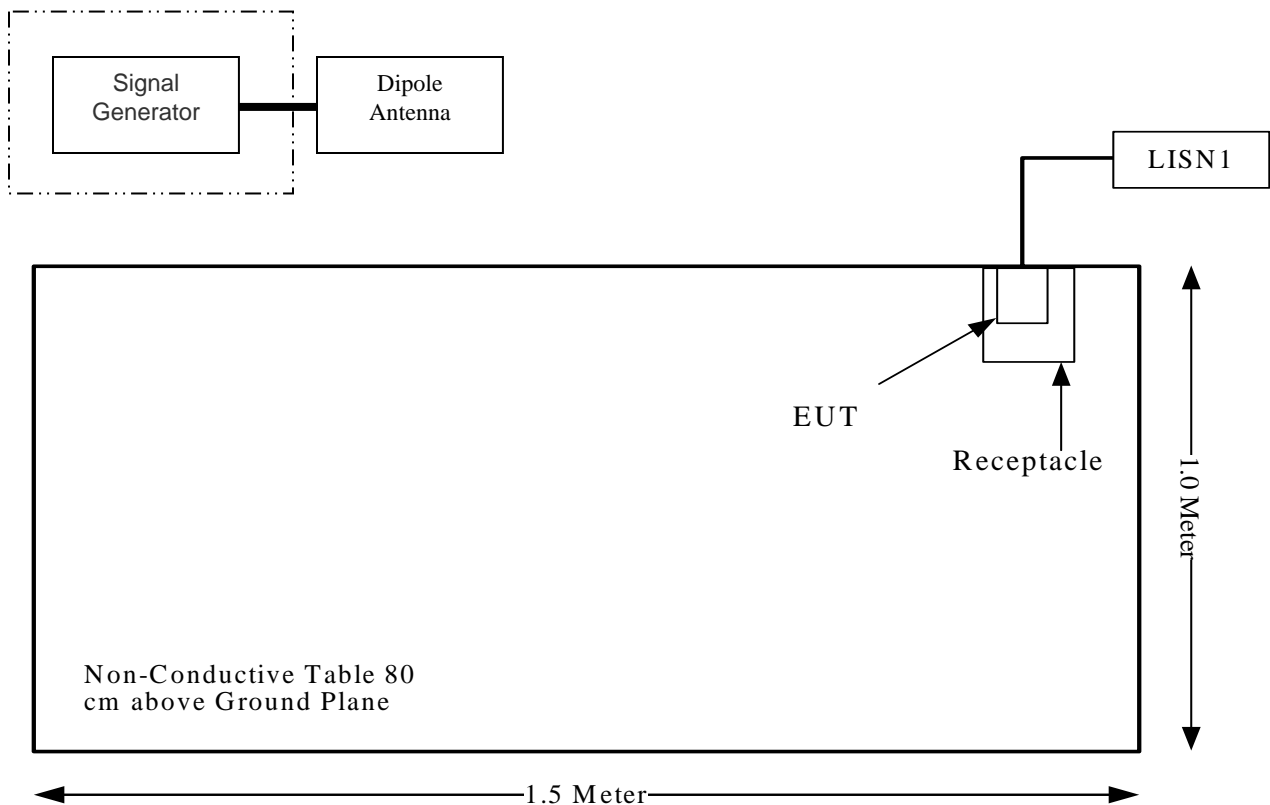
### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HP	Signal Generator	8648A	3426A00831

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

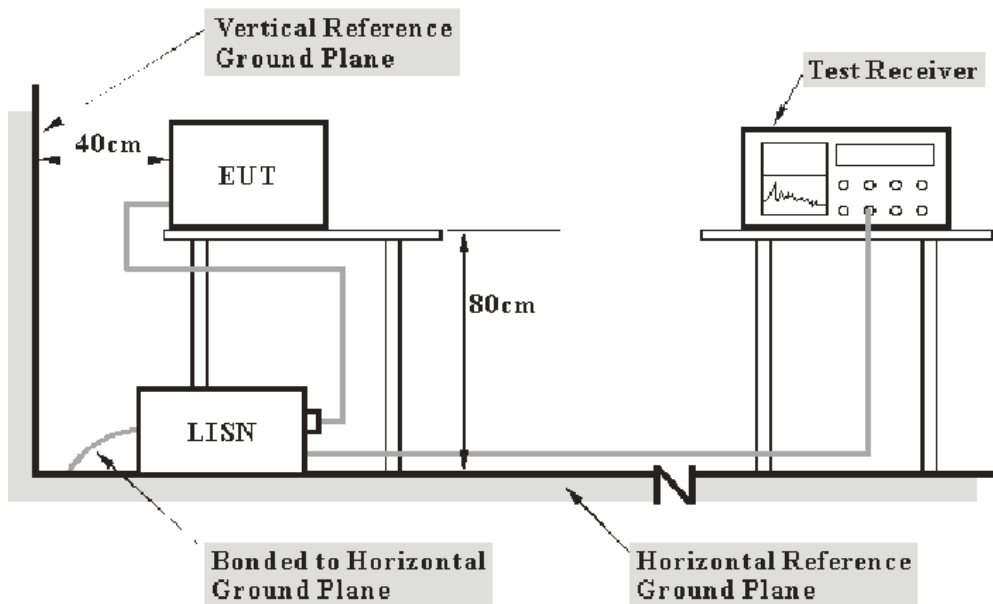
## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 2.4 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 C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

The EUT 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:

<b><i>Frequency Range</i></b>	<b><i>IF BW</i></b>
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## 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 data was recorded in the Quasi-peak and average detection mode.

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

**29.46 dB at 7.180MHz** in the **Line** conducted mode.

## Test Data

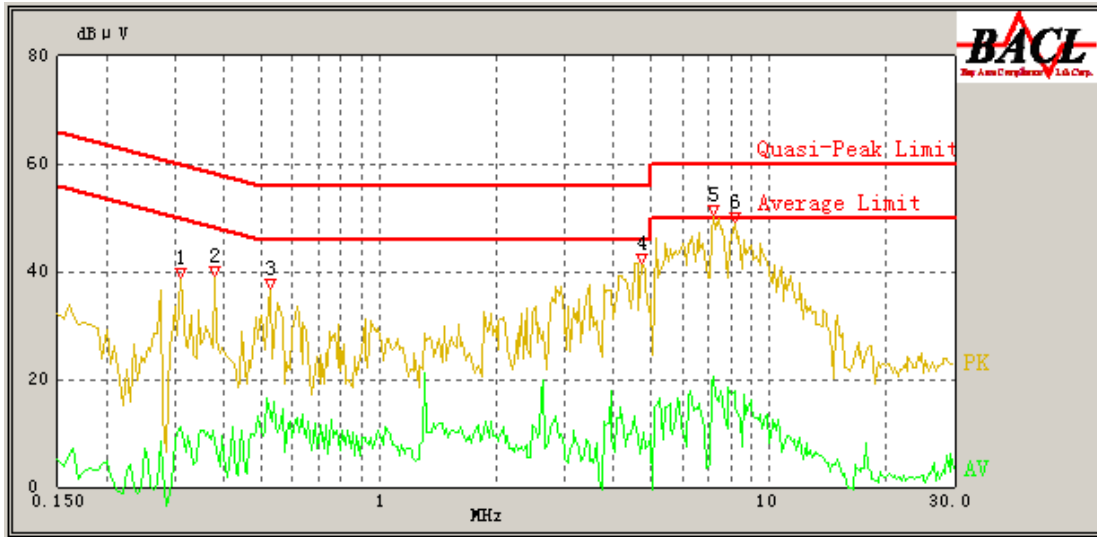
### Environmental Conditions

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Dean Liu on 2012-06-04.*

**Mode: Receiving**

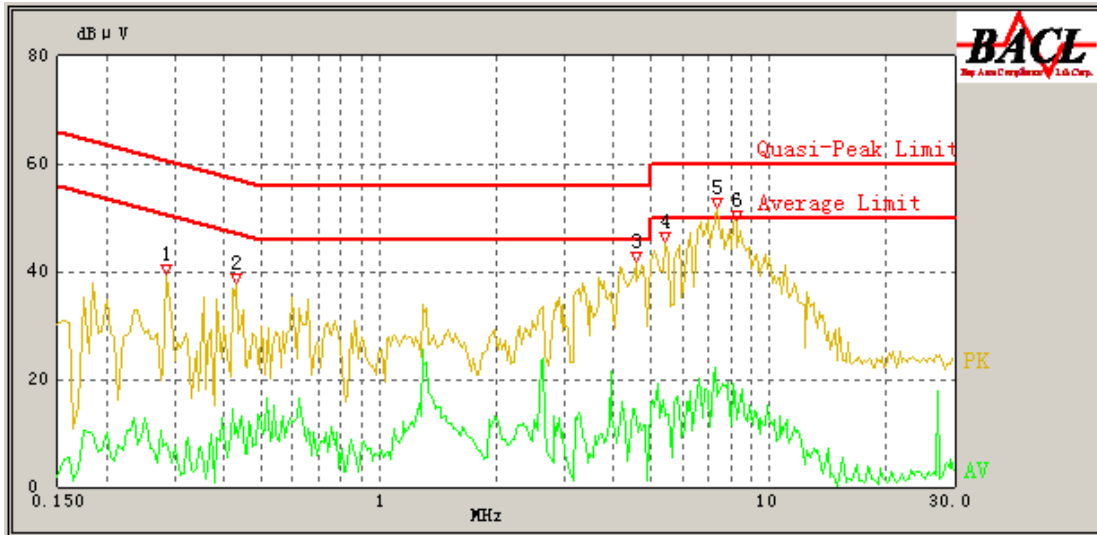
**AC 120V/60 Hz, Line**



Frequency (MHz)	Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/ QP/Ave.)
7.180	20.54	0.55	50.00	29.46	Ave.
8.185	17.98	0.59	50.00	32.02	Ave.
0.525	13.53	0.42	46.00	32.47	Ave.
7.230	25.16	0.55	60.00	34.84	QP
8.185	22.80	0.59	60.00	37.20	QP
4.725	18.50	0.51	56.00	37.50	QP
4.740	7.94	0.51	46.00	38.06	Ave.
0.525	17.58	0.42	56.00	38.42	QP
0.310	11.21	0.42	51.43	40.22	Ave.
0.380	8.49	0.42	49.43	40.94	Ave.
0.310	18.63	0.42	61.43	42.80	QP
0.380	15.35	0.42	59.43	44.08	QP



AC 120V/60 Hz, Neutral



Frequency (MHz)	Reading (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
4.525	14.49	0.51	46.00	31.51	Ave.
7.375	27.72	0.56	60.00	32.28	QP
8.230	17.11	0.59	50.00	32.89	Ave.
7.375	16.72	0.56	50.00	33.28	Ave.
5.375	16.02	0.52	50.00	33.98	Ave.
0.430	11.27	0.42	48.00	36.73	Ave.
4.560	16.28	0.51	56.00	39.72	QP
8.275	20.27	0.60	60.00	39.73	QP
5.400	17.62	0.52	60.00	42.38	QP
0.430	14.96	0.42	58.00	43.04	QP
0.285	8.02	0.42	52.14	44.12	Ave.
0.285	11.46	0.42	62.14	50.68	QP

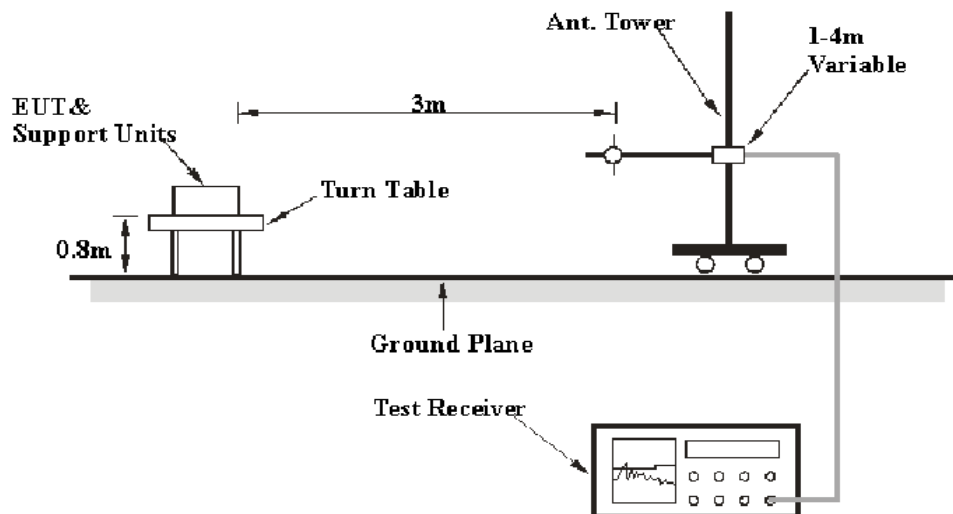
## FCC §15.109 - RADIATED EMISSIONS

### 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, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is  $\pm 4.0$  dB. ( $k=2$ , 95% level of confidence)

### EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 2000 MHz.

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

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 2 GHz	1 MHz	3 MHz	PK
1000 MHz – 2 GHz	1 MHz	10 Hz	Ave.

## Test Procedure

During the radiated emissions test, the EUT was connected to AC floor outlet

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

All data was recorded in Quasi-peak detection mode from 30 MHz to 1000 MHz, peak and average detection mode for frequency above 1 GHz.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-07-08	2012-07-07
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-07-05	2012-07-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2011-07-08	2012-07-07

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

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

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 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:

13.5 dB at 422.8500 MHz in the **Horizontal** polarization.

**Test Data**

**Environmental Conditions**

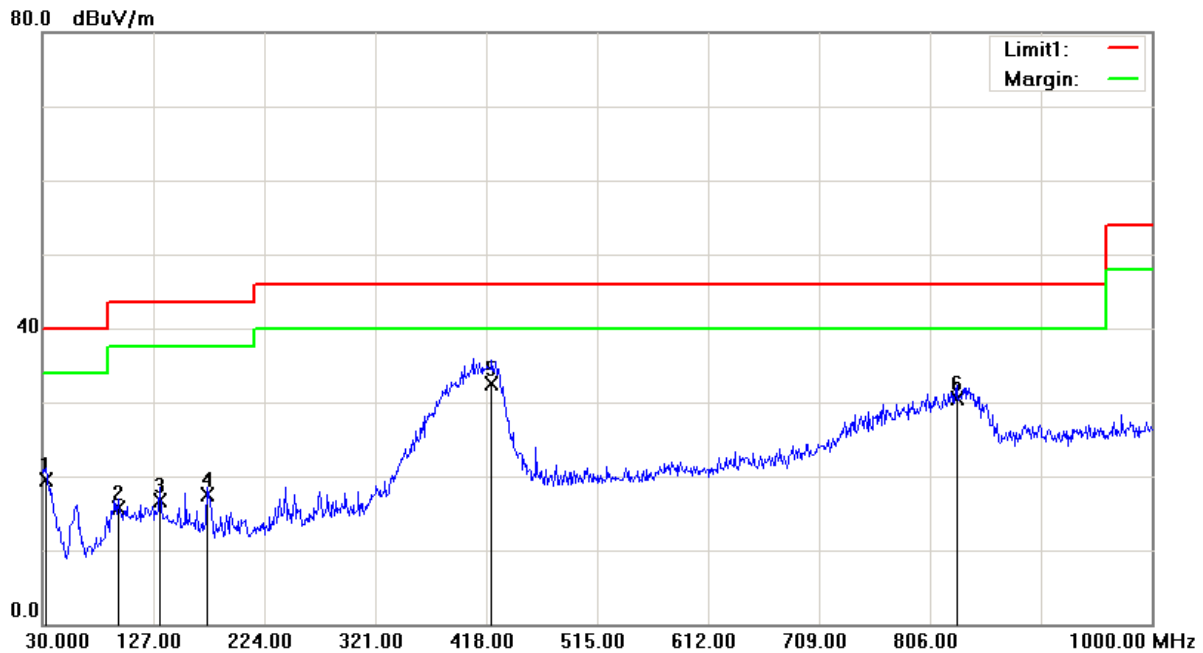
<b>Temperature:</b>	26 °C
<b>Relative Humidity:</b>	60 %
<b>ATM Pressure:</b>	100.0 kPa

The testing was performed by Dean Liu on 2012-06-04.

EUT Operation Mode: Receiving

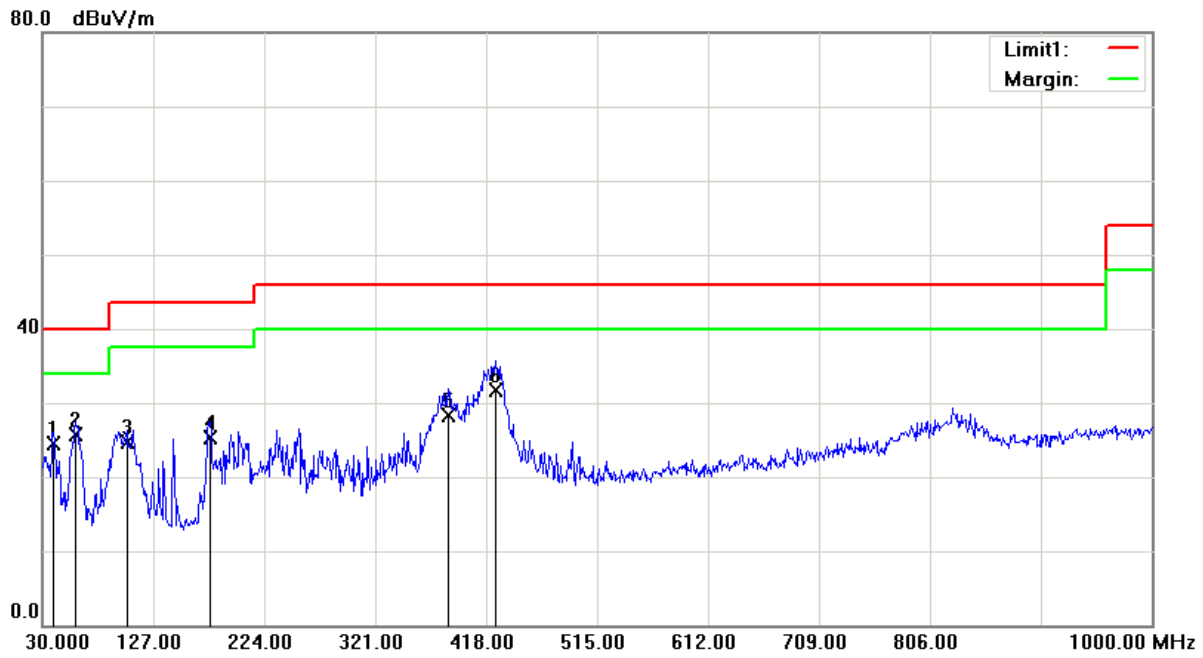
**1) Below 1GHz:**

**Horizontal**



Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
422.8500	35.94	QP	-3.44	32.50	46.00	13.50
829.2800	28.63	QP	1.87	30.50	46.00	15.50
32.9100	20.18	QP	-0.68	19.50	40.00	20.50
174.5300	26.36	QP	-8.76	17.60	43.50	25.90
132.8200	23.14	QP	-6.34	16.80	43.50	26.70
95.9600	26.77	QP	-10.97	15.80	43.50	27.70

**Vertical**



Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
59.1000	38.79	QP	-12.99	25.80	40.00	14.20
425.7600	35.17	QP	-3.47	31.70	46.00	14.30
39.7000	30.48	QP	-5.98	24.50	40.00	15.50
385.0200	32.67	QP	-4.27	28.40	46.00	17.60
176.4700	34.15	QP	-8.85	25.30	43.50	18.20
103.7200	33.58	QP	-8.88	24.70	43.50	18.80

**2) Above 1GHz:**

There were no emissions detected for above 1GHz.

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## DECLARATION LETTER

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### Product Similarity Declaration

To Whom It May Concern,

We, Shunde Advante Electron Ltd., hereby declare that our Wireless Doorchime Receiver, Model Number: 688-E, 688-UK are electrically identical with the Model Number: 688 that was certified by BACL. The only difference is their shell.

The rest are the same.

Please contact me if you have any question.

Signature:



Printed name: Dongyuan Hu

Title: Project Manager

Date: 2012-05-28

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