# PART15B TEST REPORT

| | |
|---|---|
| Product Name: | **5-Channel Door Popper System Controller** |
| Trademark: | **N/A** |
| FCC ID: | **2AEL5 PC-5** |
| Model Number: | **Digitel, LLC** |
| Prepared For : | 2094 N Dragoon St, Tucson AZ USA |
| Address : | **Shenzhen BCTC Technology Co., Ltd.** |
| Prepared By : | A. Floor 3, 44 Building, Tanglang Industrial Park B, Taoyuan Street, Nanshan District, Shenzhen, China |
| Test Date: | **Apr. 13 - Apr. 20, 2015** |
| Date of Report : | **Apr. 20, 2015** |
| Report No.: | **BCTC-150403970** |

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# TEST REPORT DECLARATION

| | | |
|---|---|---|
| Applicant | : | Digitel, LLC |
| Address | : | 2094 N Dragoon St, Tucson AZ USA |
| EUT Description | : | 5-Channel Door Popper System Controller |
| Model Number | : | PC-5 |
| Operation Frequency: | | 433.92MHz(Only receiver) |

Test Standards:

**FCC Part 15 B: 2014**
**ANSI C63.4: 2014**

The EUT described above is tested by US to determine the maximum emission levels emanating from the EUT, the maximum emission levels are compared to the FCC Part 15 B Subpart Class B limits.
The measurement results are contained in this test report and Shenzhen BCTC Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these measurements.

Also, this report shows that the EUT is to be technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen BCTC Technology Co., Ltd.

Date of Test**:** **Apr. 13 - Apr. 20, 2015**

Prepared by(Engineer)**:** Snow Zeng

Reviewer(Quality Manager)**:** Sophie Lee

Approved & Authorized Signer(Manager)**:** Casey Wang

SHENZHEN BCTC TECHNOLOGY CO., LTD. APPROVED

# 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 BCTC approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BCTC 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, BCTC therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3.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 BCTC, unless the applicant has authorized BCTC in writing to do so.

## 1.2.Measurement Uncertainty

Available upon request.

## 1.3.Test Facility

Site Description

| | | |
|---|---|---|
| Name of Firm | : | Shenzhen BCTC Technology Co., Ltd. |
| Site Location | : | No.101,Yousong Road,Longhua New District, Shenzhen,China |
| FCC Registration No. | | 187086 |

## 1.4.Test Uncertainty

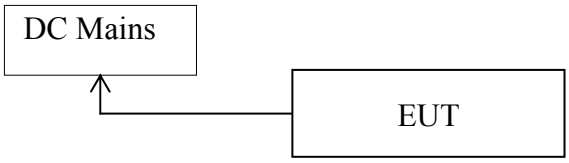
| | | |
|---|---|---|
| Conducted Emission Uncertainty | = | ±2.66dB |
| Radiated Emission Uncertainty | = | ±4.15dB |

# 2. PRODUCT DESCRIPTION

## 2.1.EUT Description

| | | |
|---|---|---|
| Description | : | **5-Channel Door Popper System Controller** |
| Applicant | : | **Digitel, LLC**<br>2094 N Dragoon St, Tucson AZ USA |
| Manufacturer | : | **Zhongshan Eagle Electronic Technology Co., Ltd.**<br>No.40 Yanhe East Road, Dongsheng Town, Zhongshan City, Guangdong, China |
| Model Number | : | **PC-5** |

## 2.2.Block Diagram of EUT Configuration




## 2.3.Test Conditions

Temperature: 23~25℃

Relative Humidity: 55~63 %

# 3. TEST RESULTS SUMMARY

**Table 1 Test Results Summary**

| Test Items | Test Results |
|---|---|
| Conducted disturbance | N/A |
| Radiated disturbance | Pass |

Remark: “N/A” means “Not applicable.”

# 4. TEST EQUIPMENT USED

## 4.1.For Conducted Emission Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | Rohde & Schwarz | ESHS30 | 828985/018 | Aug. 25, 14 | 1 Year |
| 2 | Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100006 | Aug. 25, 14 | 1 Year |
| 3 | L.I.S.N. | Rohde & Schwarz | ESH2-Z5 | 834549/005 | Aug. 25, 14 | 1 Year |
| 4 | Conical | Emtek | N/A | N/A | N/A | N/A |
| 5 | Voltage Probe | Schwarzbeck | TK9416 | N/A | Aug. 25, 14 | 1 Year |
| 6 | Coaxial Switch | Anritsu | MP59B | 6100214550 | Aug. 25, 14 | 1 Year |

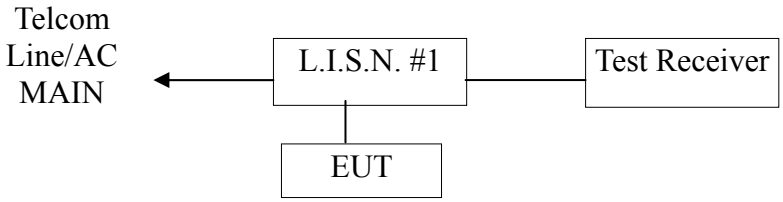
## 4.2.For Radiated Emission Measurement

Anechoic Chamber

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | Agilent | E4407B | MY45108040 | 2014.07.05 | 1 Year |
| 2 | Test Receiver | R&S | ESPI | 101318 | 2014.06.06 | 1 Year |
| 3 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 2014.07.05 | 1 Year |
| 4 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2014.06.06 | 1 Year |
| 5 | Spectrum Analyzer | ADVANTEST | R3132 | 150900201 | 2014.06.06 | 1 Year |
| 6 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | 2014.07.05 | 1 Year |
| 7 | Horn Ant | Schwarzbeck | BBHA 9170 | 9170-181 | 2014.07.05 | 1 Year |
| 8 | Amplifier | EM | EM-30180 | 060538 | 2014.12.21 | 1 Year |
| 9 | Loop Antenna | ARA | PLA-1030/B | 1029 | 2014.06.07 | 1 Year |
| 10 | Power Meter | R&S | NRVS | 100696 | 2014.07.05 | 1 Year |
| 11 | Power Sensor | R&S | URV5-Z4 | 0395.1619.05 | 2014.07.05 | 1 Year |
| 12 | RF cables | R&S | R203 | R20X | 2014.07.05 | 1 Year |

# 5. CONDUCTED EMISSION TEST

## 5.1.Block Diagram of Test Setup




(EUT: **5-Channel Door Popper System Controller** )

## 5.2.Test Standard

FCC Part 15 B: 2014

## 5.3.Conducted Emission Limit (Class B)

| Frequency MHz | Limits dB(μV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 0.15 ~ 0.50 | 66 ~ 56* | 56 ~ 46* |
| 0.50 ~ 5.00 | 56 | 46 |
| 5.00 ~ 30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.

## 5.4.EUT Configuration on Test

The following equipments are installed on conducted emission test to meet Part 15 B requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.1.**5-Channel Door Popper System Controller**

Model Number: **PC-5**

## 5.5.Operating Condition of EUT

5.5.1.Setup the EUT and simulators as shown in Section 5.1.

5.5.2.Turn on the power of all equipments.

5.5.3.Let the EUT work in test modes (EUT Working) and test it.

## 5.6.Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESHS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz.

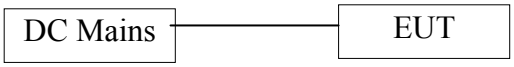
## 5.7.Test Result

Powered by car battery solely, so Conducted emission is not applicable

# 6. RADIATED EMISSION MEASUREMENT

## 6.1.Block Diagram of Test Setup

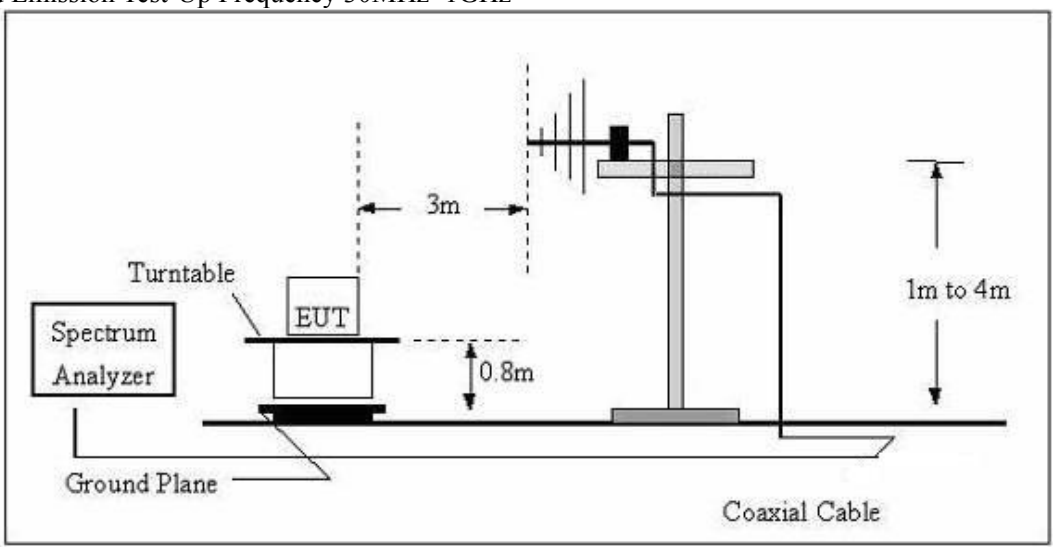
### 6.1.1.Block Diagram of connection between the EUT and the simulators



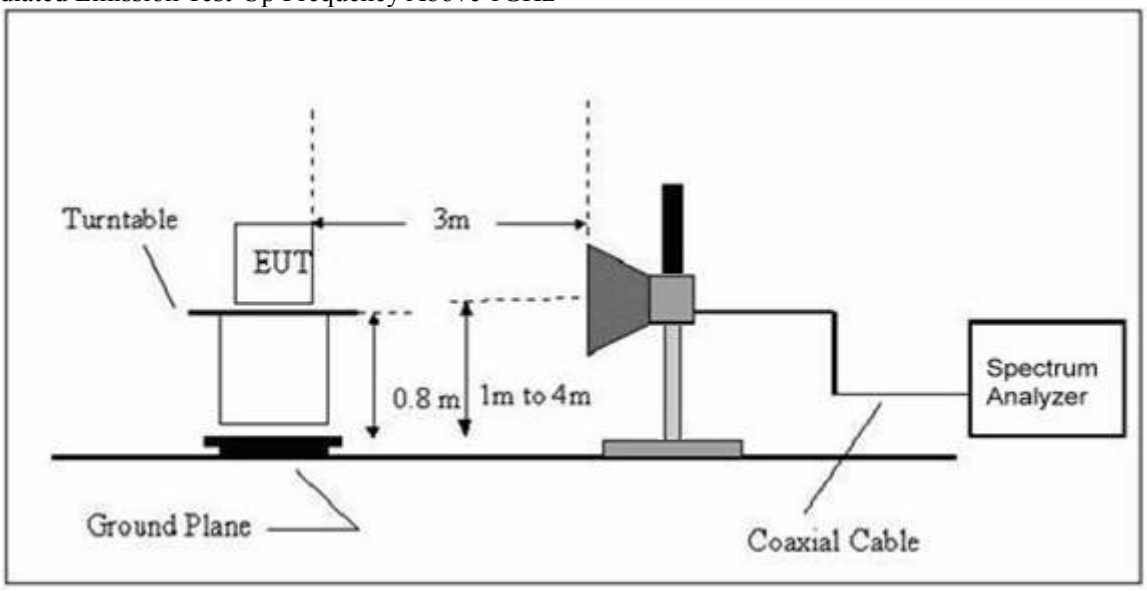

(EUT: **5-Channel Door Popper System Controller** )

### 6.1.2.Anechoic Chamber Test Setup Diagram

Radiated Emission Test-Up Frequency 30MHz~1GHz




Radiated Emission Test-Up Frequency Above 1GHz



## 6.2.Test Standard

FCC Part 15 B: 2014

## 6.3.Radiated Emission Limit(Class B)

| FREQUENCY (MHz) | DISTANCE (Meters) | FIELD STRENGTHS LIMITS (dBμV/m) |
|---|---|---|
| 30 ~ 88 | 3 | 40.0 |
| 88 ~ 216 | 3 | 43.5 |
| 216 ~ 960 | 3 | 46.0 |
| 960 ~ 1000 | 3 | 54.0 |

Note**:**(1) The smaller limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT or system.

## 6.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize Its emission characteristics in normal application.

Operating Condition of EUT

6.4.1.Setup the EUT as shown on Section 6.1

6.4.2.Turn on the power of all equipments.

6.4.3.Let the EUT work in test mode(EUT working) and measure it.

## 6.5.Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

The bandwidth setting on the test receiver is 120 KHz.

The EUT is tested in Anechoic Chamber. The frequency range from 30MHz to 1000MHz is checked. All the test results are listed in Section 6.6.

## 6.6.Test Result

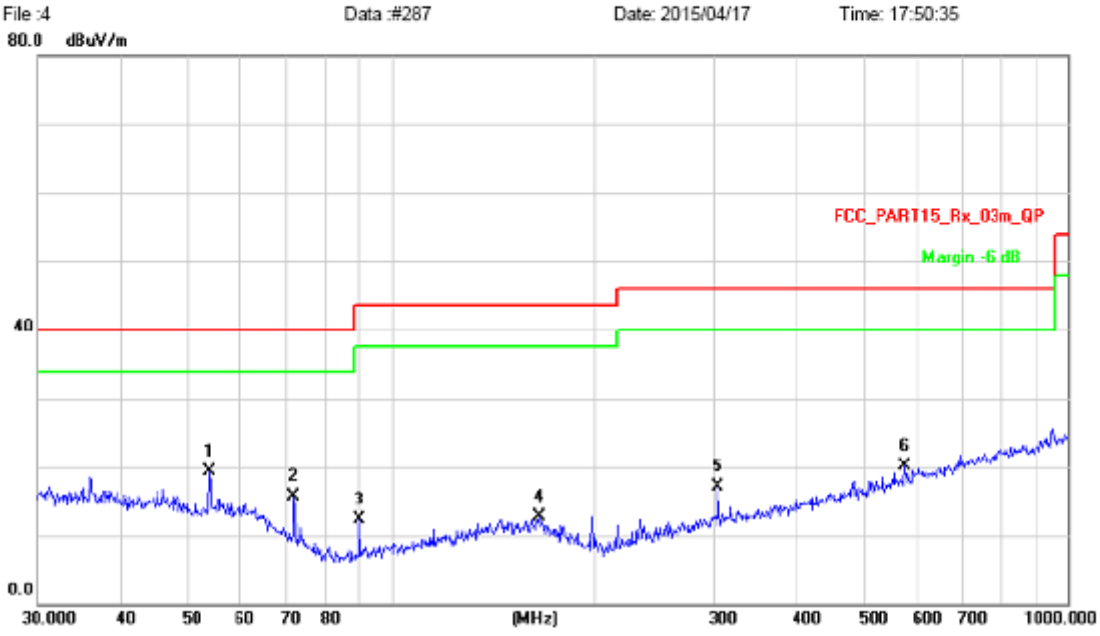
PASS

Please refer to the following pages.

RECEIVE MODE:

倍测检测
BCTC TEST
Address:No.101,Yousong Road,Longhua New District,
Shenzhen, Guangdong P.R.China
Tel:400-788-9558

**Radiated Emission Measurement**




Site 966 BCTC Chamber #1
Limit: FCC_PART15_Rx_03m_QP
EUT: 5-Channel Door Popper System Controller
M/N: PC-5

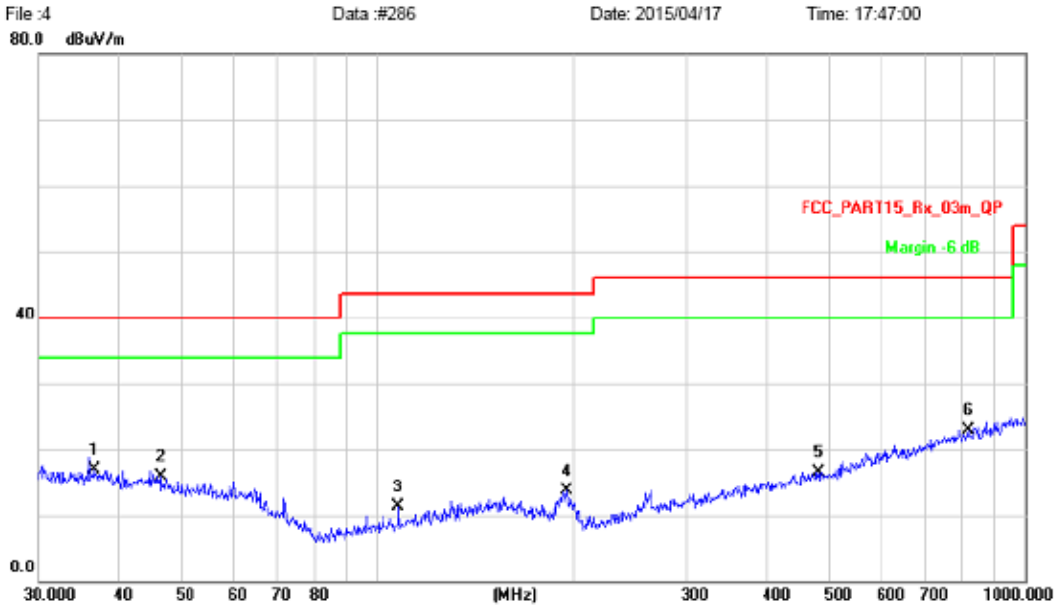
Polarization: *Horizontal*
Power: DC 12V
Distance: 3m

Temperature: 26
Humidity: 55 %

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | * | 53.8818 | 30.15 | -10.93 | 19.22 | 40.00 | -20.78 | peak | | | |
| 2 | | 71.8320 | 30.95 | -15.19 | 15.76 | 40.00 | -24.24 | peak | | | |
| 3 | | 89.9047 | 29.84 | -17.51 | 12.33 | 43.50 | -31.17 | peak | | | |
| 4 | | 165.4866 | 25.80 | -13.19 | 12.61 | 43.50 | -30.89 | peak | | | |
| 5 | | 304.6099 | 29.55 | -12.47 | 17.08 | 46.00 | -28.92 | peak | | | |
| 6 | | 574.6258 | 26.49 | -6.44 | 20.05 | 46.00 | -25.95 | peak | | | |

倍测检测 BCTC TEST
Address:No.101,Yousong Road,Longhua New District,
Shenzhen, Guangdong P.R.China
Tel:400-788-9558

**Radiated Emission Measurement**




Site 966 BCTC Chamber #1
Limit: FCC_PART15_Rx_03m_QP
EUT: 5-Channel Door Popper System Controller
M/N: PC-5

Polarization: *Vertical*
Power: DC 12V
Distance: 3m

Temperature: 26
Humidity: 55 %

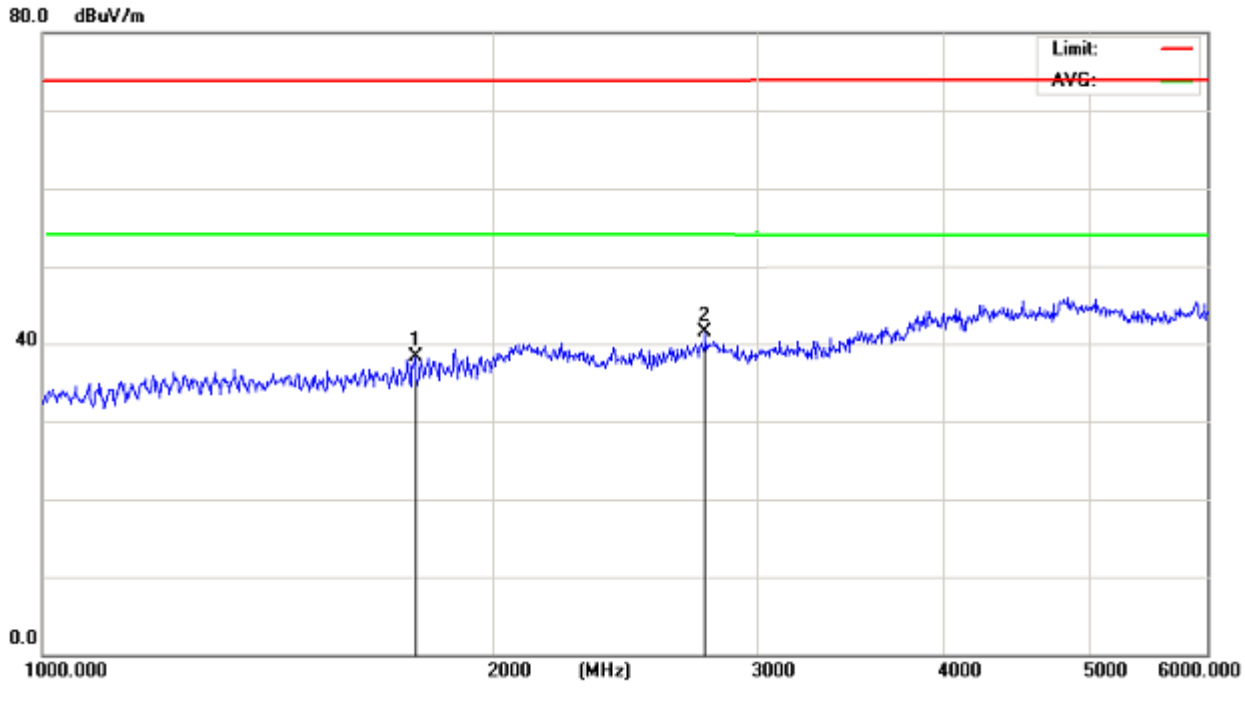
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 36.6375 | 25.46 | -8.64 | 16.82 | 40.00 | -23.18 | peak | | | |
| 2 | | 46.3402 | 25.68 | -9.70 | 15.98 | 40.00 | -24.02 | peak | | | |
| 3 | | 107.8877 | 27.12 | -15.83 | 11.29 | 43.50 | -32.21 | peak | | | |
| 4 | | 195.8220 | 29.70 | -15.94 | 13.76 | 43.50 | -29.74 | peak | | | |
| 5 | | 480.5276 | 24.96 | -8.42 | 16.54 | 46.00 | -29.46 | peak | | | |
| 6 | * | 818.8341 | 25.20 | -2.33 | 22.87 | 46.00 | -23.13 | peak | | | |

ABOVE 1GHz: (1G-6GHz)

| | | | |
|---|---|---|---|
| EUT: | 5-Channel Door Popper System Controller | Model Name: | PC-5 |
| Temperature: | 24 °C | Relative Humidity: | 54 % |
| Pressure: | 1010 hPa | Polarization : | Horizontal |
| Test Power : | DC 12V | Test Mode : | Receive mode |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 1774.224 | 53.48 | -15.13 | 38.35 | 74 | -35.65 | peak |
| 2771.839 | 53.05 | -11.59 | 41.46 | 74 | -32.54 | peak |
| | | | | | | |
| | | | | | | |

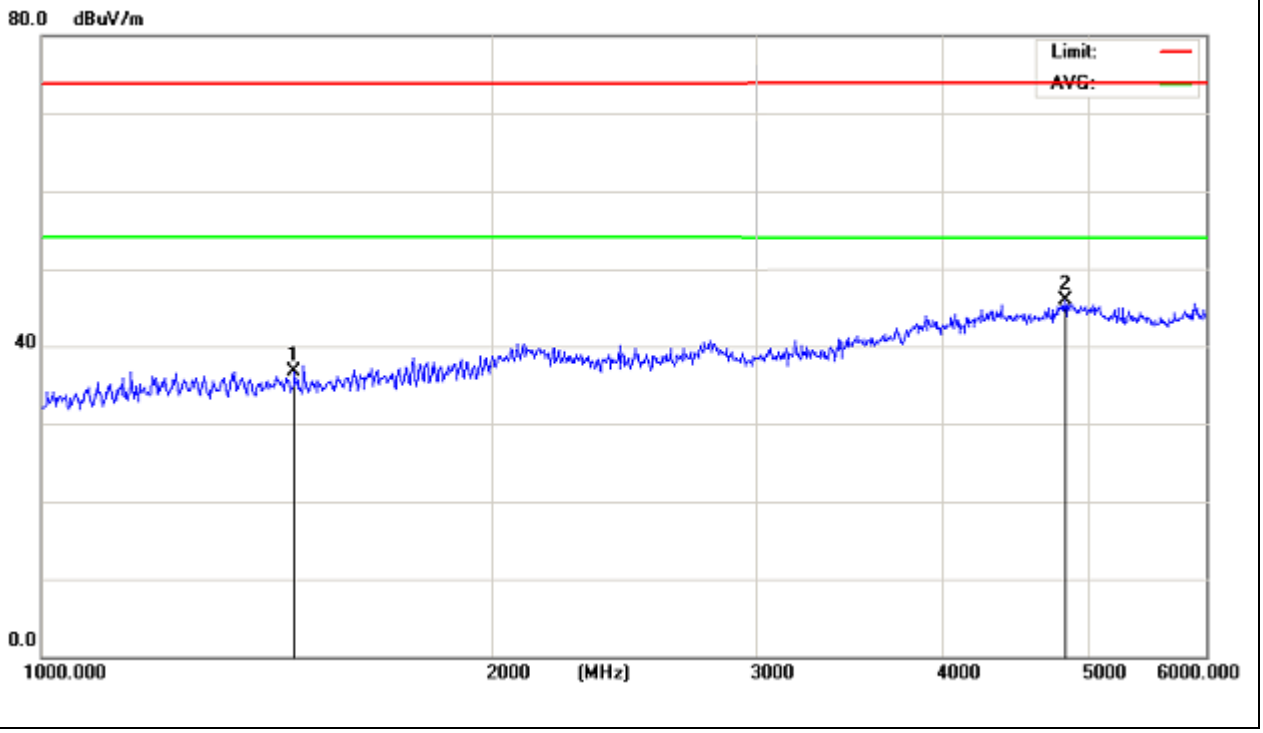
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



| EUT: | 5-Channel Door Popper System Controller | Model Name: | PC-5 |
|---|---|---|---|
| Temperature: | 24 °C | Relative Humidity: | 54 % |
| Pressure: | 1010 hPa | Polarization : | Vertical |
| Test Power : | DC 12V | Test Mode : | Receive mode |

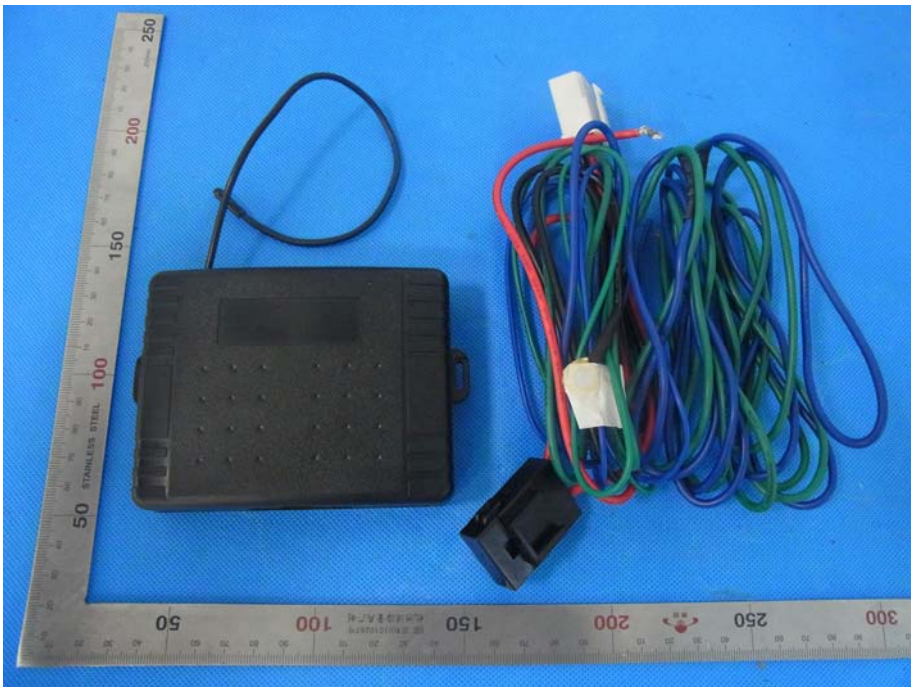
| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 1475.227 | 53.72 | -17.06 | 36.66 | 74 | -37.34 | peak |
| 4830.532 | 49.5 | -3.57 | 45.93 | 74 | -28.07 | peak |
| | | | | | | |
| | | | | | | |

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

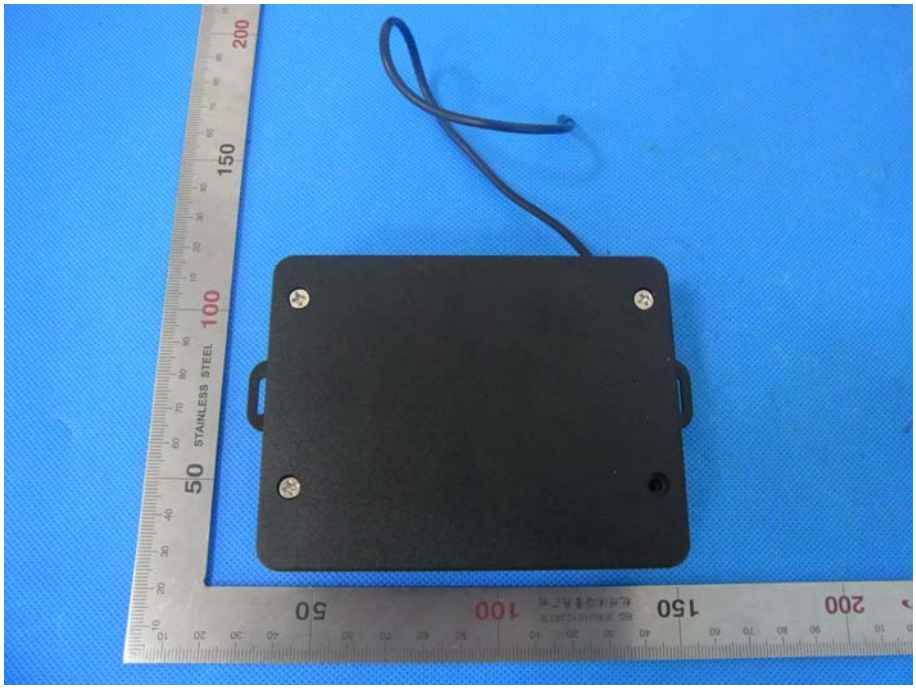


# APPENDIX I (PHOTOS OF THE EUT)

**EUT Photo 1**

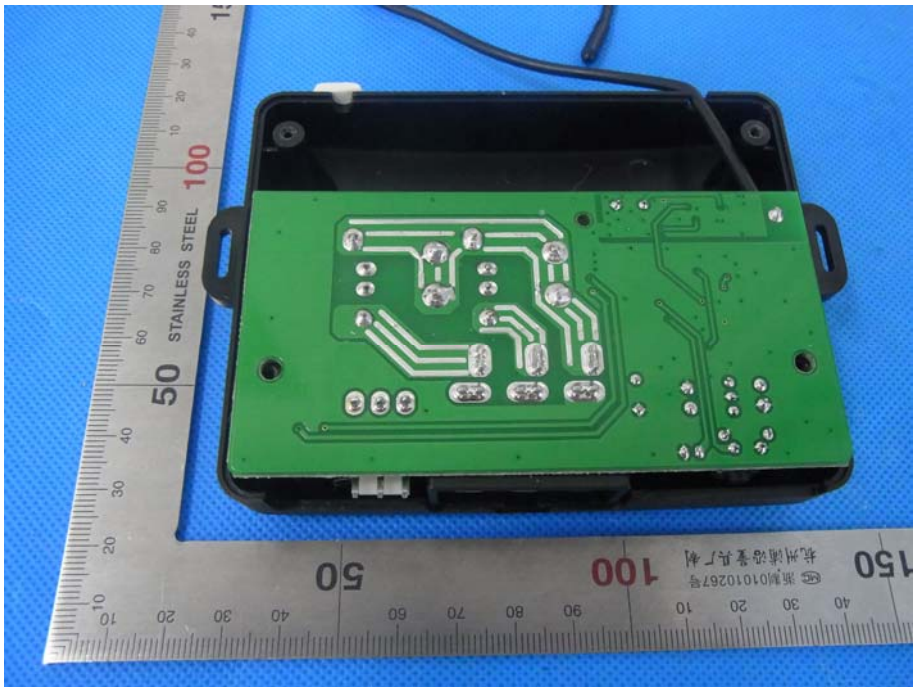


**EUT Photo 2**

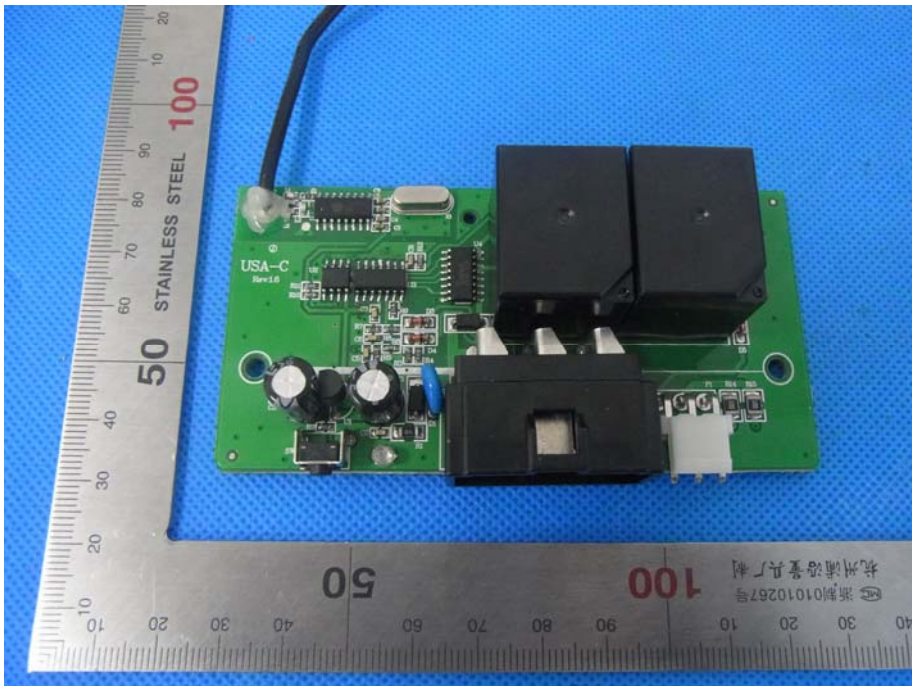


**EUT Photo 3**

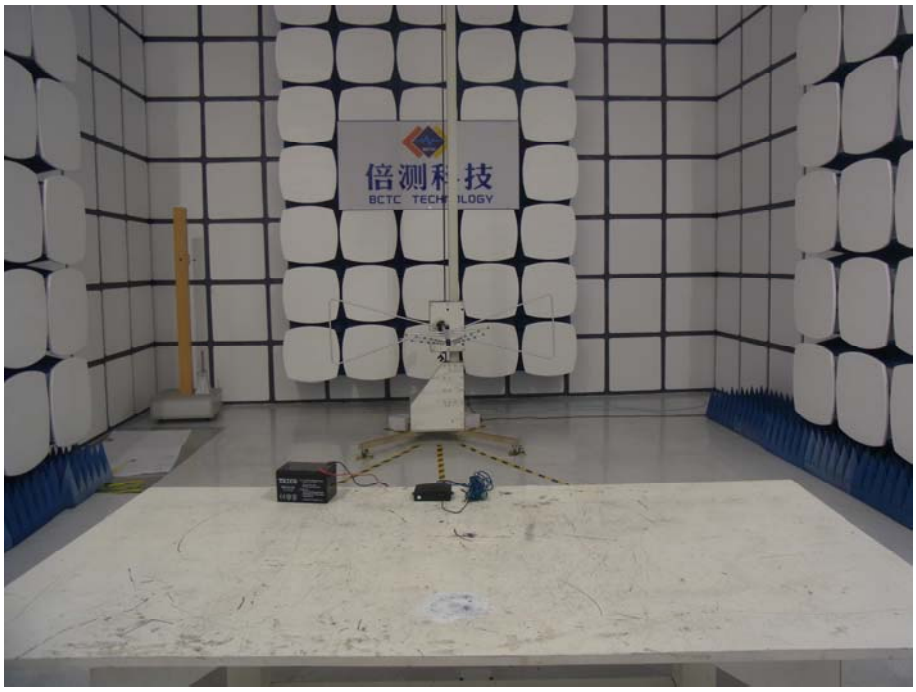

**EUT Photo 4**

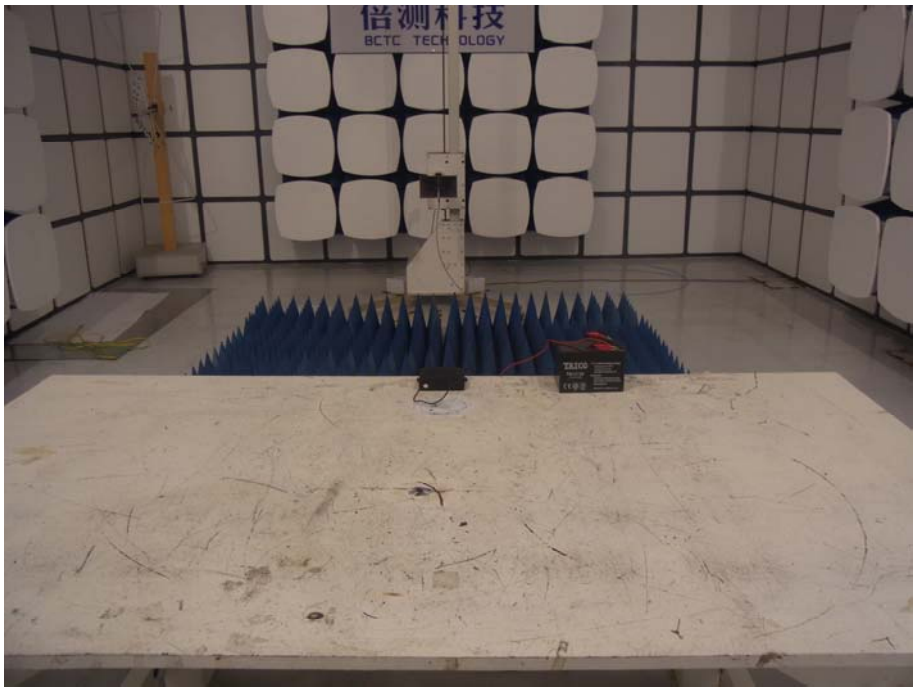


**EUT Photo 5**



# APPENDIX II (TEST PHOTOS OF THE EUT)





**※※※※※ END OF REPORT ※※※※※**