



## **STC Test Report**

Date : 2009-10-27

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No. : MH183412

**Applicant (C00699):** Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd  
The opposition of Xinjiang Community Education Base,  
Guangming New District, Shenzhen, China

**Manufacturer:** Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd  
The opposition of Xinjiang Community Education Base,  
Guangming New District, Shenzhen, China

**Description of Samples:** Product: Transmitter  
Brand Name: N/A  
Model Number: TX-010A  
FCC ID: XUN002425

**Date Samples Received:** 2009-09-14

**Date Tested:** 2009-09-29

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in  
accordance with FCC 47CFR [Codes of Federal Regulations]  
Part 15: 2008 and ANSI C63.4:2003 for FCC Certification.

**Conclusions:** The submitted product COMPLIED with the requirements of  
Federal Communications Commission [FCC] Rules and  
Regulations Part 15. The tests were performed in accordance  
with the standards described above and on Section 2.2 in this  
Test Report.

**Remarks:** ----

Dr. LEE Kam Chuen  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
The Hong Kong Standards and Testing Centre Ltd.

**The Hong Kong Standards and Testing Centre Ltd.**

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### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate  
New Territories, Hong Kong

#### **1.2 Applicant Details** **Applicant**

Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd  
The opposition of Xinjiang Community Education Base, Guangming New District, Shenzhen,  
China

#### **Manufacturer**

Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd  
The opposition of Xinjiang Community Education Base, Guangming New District, Shenzhen,  
China

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### **1.3 Equipment Under Test [EUT] Description of Sample**

|                |  |
|----------------|--|
| Product:       | Transmitter  |
| Manufacturer:  | Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd |
| Brand Name:    | N/A  |
| Model Number:  | TX-010A  |
| Input Voltage: | 6Vd.c. ("AA" size battery×4)                         |

#### **1.3.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a Shenzhen Shen's Tongchuang Aeronautic Model Co., Ltd, Transmitter. The EUT was set to fixed frequency test mode by application

### **1.4 Date of Order**

2009-09-14

### **1.5 Submitted Sample(s):**

1 Sample

### **1.6 Test Duration**

2009-09-29

### **1.7 Country of Origin**

China

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### **2.0 Technical Details**

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 Regulations and ANSI C63.4:2003 for FCC Certification.

#### **2.2 Test Standards and Results Summary Tables**

| <b>EMISSION<br/>Results Summary</b>                       |                  |                 |                     |                                     |                          |                          |
|---|------------------|-----------------|---------------------|-------------------------------------|--------------------------|--------------------------|
| Test Condition  | Test Requirement | Test Method     | Class /<br>Severity | Test Result                         |                          |                          |
|   |                  |                 |                     | Pass                                | Fail                     | N/A                      |
| Field Strength of<br>Fundamental & Harmonics<br>Emissions | FCC 47CFR 15.249 | ANSI C63.4:2003 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Radiated Emissions  | FCC 47CFR 15.209 | ANSI C63.4:2003 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Radiated Emissions**

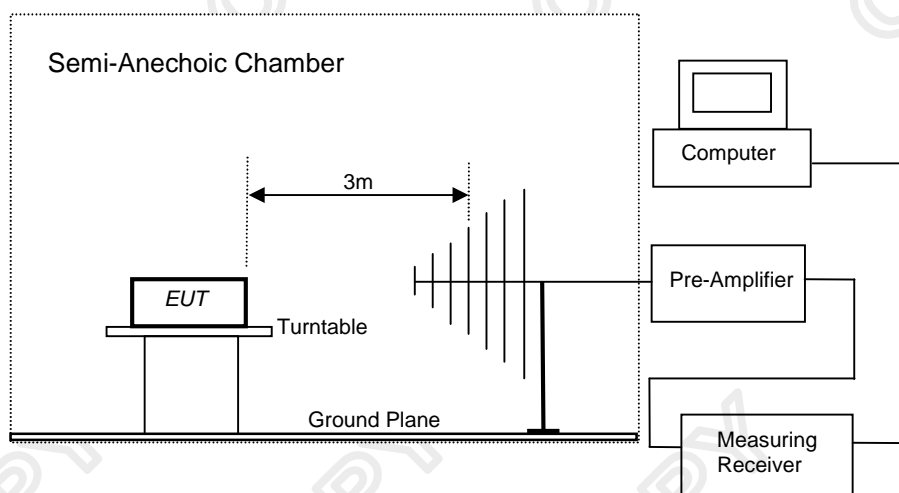
Test Requirement: FCC 47CFR 15.249  
Test Method: ANSI C63.4:2003  
Test Date: 2009-09-29  
Mode of Operation: Communication mode

#### **Test Method:**

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

#### **Test Setup:**



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### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

| Frequency Range of Fundamental<br>[MHz] | Field Strength of Fundamental Emission<br>[microvolts/meter] | Field Strength of Harmonics Emission<br>[microvolts/meter] |
|---|--|--|
| 902-928                                 | 50,000 [Average]   | 500 [Average]  |
| 2400-2483.5                             | 50,000 [Average]   | 500 [Average]  |

### Results of Communication mode (Lowest Frequency): Pass

| Field Strength of Fundamental Emissions<br>Peak Value |                               |                             |                          |                        |                    |                  |
|---|-------------------------------|-----------------------------|--------------------------|------------------------|--------------------|------------------|
| Frequency<br>MHz                                      | Measured Level @ 3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @ 3m<br>μV/m | E-Field Polarity |
| 2410.0  | 57.6                          | 34.9                        | 92.5                     | 42,169.7               | 500,000            | Vertical         |
| * 4820.0  | No Emission Detected          |                             |                          |                        | 500                | Vertical         |
| 7230.0  |                               |                             |                          |                        | 500                | Vertical         |
| 9640.0  |                               |                             |                          |                        | 500                | Vertical         |
| * 12050.0   |                               |                             |                          |                        | 500                | Vertical         |
| 14460.0   |                               |                             |                          |                        | 500                | Vertical         |
| 16870.0   |                               |                             |                          |                        | 500                | Vertical         |
| * 19280.0   |                               |                             |                          |                        | 500                | Vertical         |
| 21690.0   |                               |                             |                          |                        | 500                | Vertical         |
| 24100.0   |                               |                             |                          |                        | 500                | Vertical         |

| Field Strength of Fundamental Emissions<br>Average Value |                               |                             |                          |                        |                    |                  |
|--|-------------------------------|-----------------------------|--------------------------|------------------------|--------------------|------------------|
| Frequency<br>MHz   | Measured Level @ 3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @ 3m<br>μV/m | E-Field Polarity |
| + 2410.0   | 37.6                          | 34.9                        | 72.5                     | 4,217.0                | 50,000             | Vertical         |

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -23dB

Duty Cycle Correction = -20dB, if the calculation duty cycle correction > -20dB

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB  
1GHz to 18GHz 5.1dB

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### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

| Frequency Range of Fundamental<br>[MHz] | Field Strength of Fundamental Emission<br>[microvolts/meter] | Field Strength of Harmonics Emission<br>[microvolts/meter] |
|---|--|--|
| 902-928                                 | 50,000 [Average]   | 500 [Average]  |
| 2400-2483.5                             | 50,000 [Average]   | 500 [Average]  |

### Results of Communication mode (Middle Frequency): Pass

| Field Strength of Fundamental Emissions<br>Peak Value |                              |                             |                          |                        |                   |                  |
|---|------------------------------|-----------------------------|--------------------------|------------------------|-------------------|------------------|
| Frequency<br>MHz                                      | Measured Level @3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @3m<br>μV/m | E-Field Polarity |
| 2440.0  | 58.9                         | 34.9                        | 93.8                     | 48,977.9               | 500,000           | Vertical         |
| * 4880.0  | No Emission Detected         |                             |                          |                        | 500               | Vertical         |
| 7320.0  |                              |                             |                          |                        | 500               | Vertical         |
| 9760.0  |                              |                             |                          |                        | 500               | Vertical         |
| * 12200.0   |                              |                             |                          |                        | 500               | Vertical         |
| 14640.0   |                              |                             |                          |                        | 500               | Vertical         |
| 17080.0   |                              |                             |                          |                        | 500               | Vertical         |
| * 19520.0   |                              |                             |                          |                        | 500               | Vertical         |
| 21960.0   |                              |                             |                          |                        | 500               | Vertical         |
| 24400.0   |                              |                             |                          |                        | 500               | Vertical         |

| Field Strength of Fundamental Emissions<br>Average Value |                              |                             |                          |                        |                   |                  |
|--|------------------------------|-----------------------------|--------------------------|------------------------|-------------------|------------------|
| Frequency<br>MHz   | Measured Level @3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @3m<br>μV/m | E-Field Polarity |
| + 2440.0   | 38.9                         | 34.9                        | 73.8                     | 4,897.8                | 50,000            | Vertical         |

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -23dB

Duty Cycle Correction = -20dB, if the calculation duty cycle correction > -20dB

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB  
1GHz to 18GHz 5.1dB

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### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

| Frequency Range of Fundamental<br>[MHz] | Field Strength of Fundamental Emission<br>[microvolts/meter] | Field Strength of Harmonics Emission<br>[microvolts/meter] |
|---|--|--|
| 902-928                                 | 50,000 [Average]   | 500 [Average]  |
| 2400-2483.5                             | 50,000 [Average]   | 500 [Average]  |

### Results of Tx on mode (Highest Frequency): Pass

| Field Strength of Fundamental Emissions<br>Peak Value |                              |                             |                          |                        |                   |                  |
|---|------------------------------|-----------------------------|--------------------------|------------------------|-------------------|------------------|
| Frequency<br>MHz                                      | Measured Level @3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @3m<br>μV/m | E-Field Polarity |
| 2470.0  | 55.8                         | 35.0                        | 90.8                     | 34,673.7               | 500,000           | Vertical         |
| * 4804.4  | No Emission Detected         |                             |                          |                        | 500               | Vertical         |
| 7410.0  |                              |                             |                          |                        | 500               | Vertical         |
| 9880.0  |                              |                             |                          |                        | 500               | Vertical         |
| * 12350.0   |                              |                             |                          |                        | 500               | Vertical         |
| 14820.0   |                              |                             |                          |                        | 500               | Vertical         |
| 17290.0   |                              |                             |                          |                        | 500               | Vertical         |
| * 19760.0   |                              |                             |                          |                        | 500               | Vertical         |
| 22230.0   |                              |                             |                          |                        | 500               | Vertical         |
| 24700.0   |                              |                             |                          |                        | 500               | Vertical         |

| Field Strength of Fundamental Emissions<br>Average Value |                              |                             |                          |                        |                   |                  |
|--|------------------------------|-----------------------------|--------------------------|------------------------|-------------------|------------------|
| Frequency<br>MHz   | Measured Level @3m<br>dBμV/m | Correction Factor<br>dBμV/m | Field Strength<br>dBμV/m | Field Strength<br>μV/m | Limit @3m<br>μV/m | E-Field Polarity |
| + 2470.0   | 35.8                         | 35.0                        | 70.8                     | 3,467.4                | 50,000            | Vertical         |

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -23dB

Duty Cycle Correction = -20dB, if the calculation duty cycle correction > -20dB

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB  
1GHz to 18GHz 5.1dB

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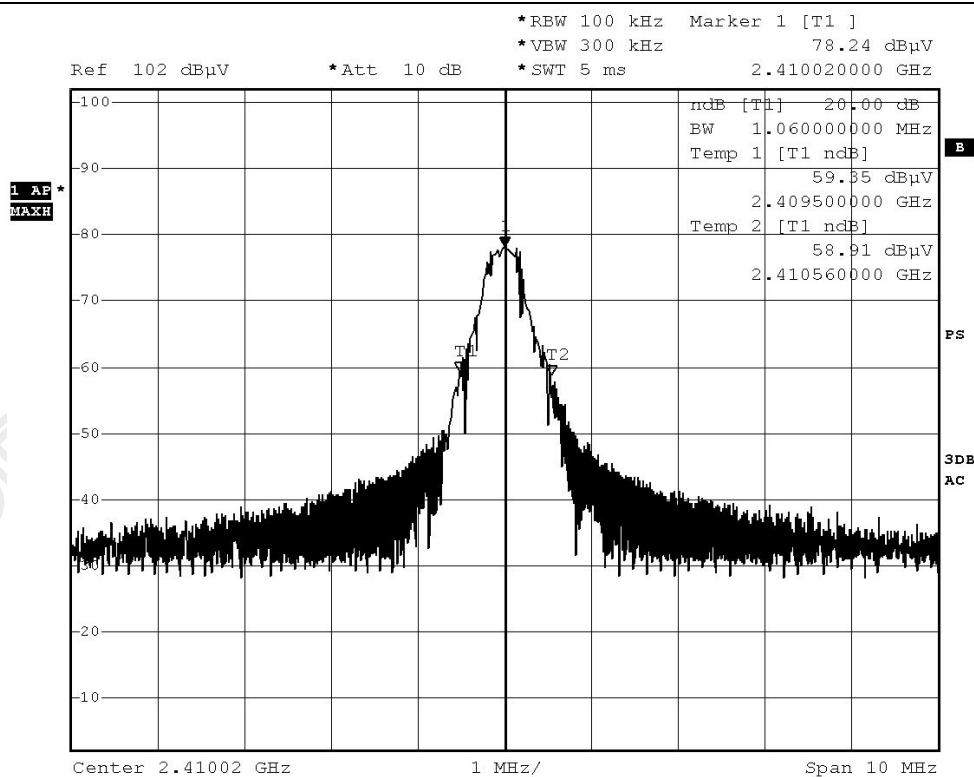
No. : MH183412

### Limits for 20dB Bandwidth of Fundamental Emission:

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2410                     | 1.06                    |

### Lowest Frequency

#### 20dB Bandwidth of Fundamental Emission



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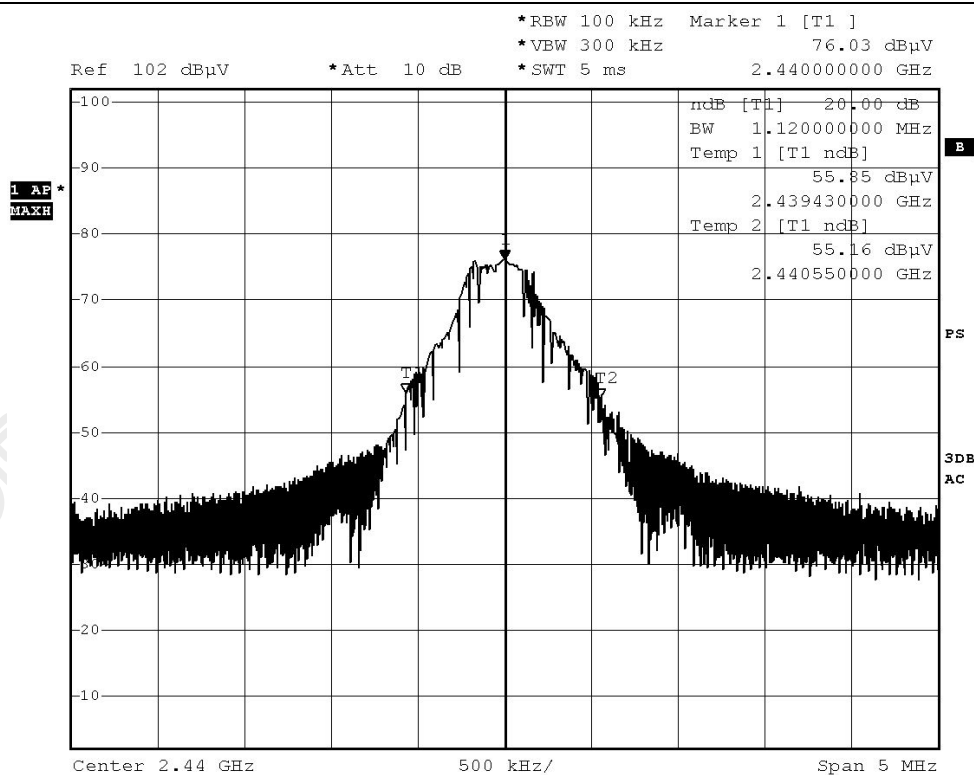
No. : MH183412

### Limits for 20dB Bandwidth of Fundamental Emission:

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2440                     | 1.12                    |

### Middle Frequency

#### 20dB Bandwidth of Fundamental Emission



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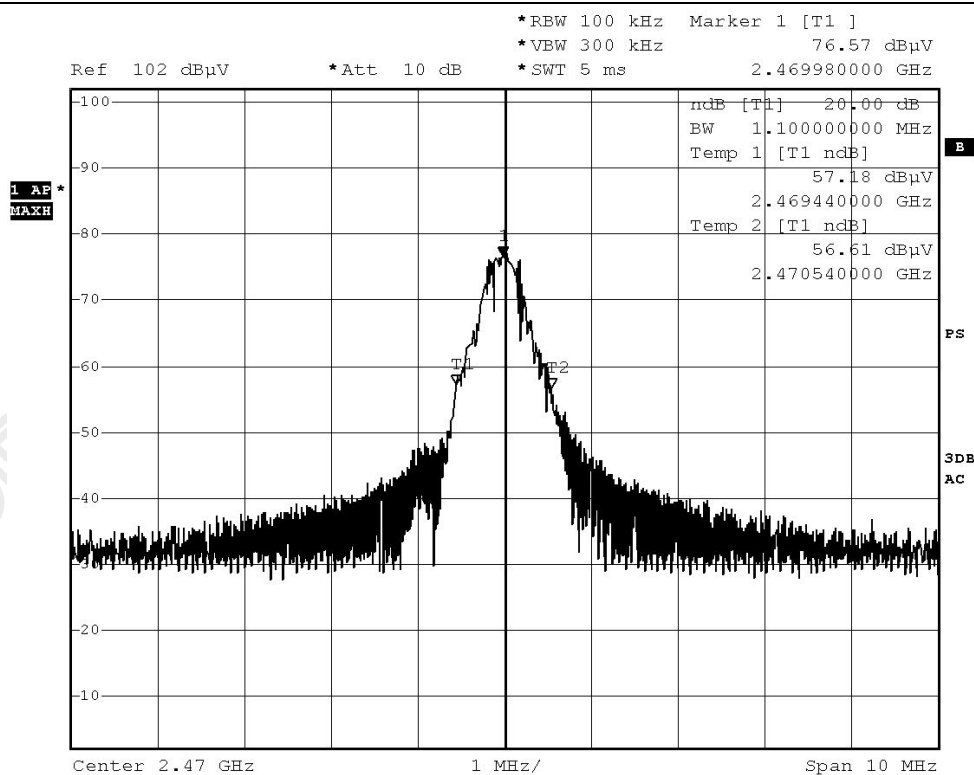
No. : MH183412

### Limits for 20dB Bandwidth of Fundamental Emission:

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2470                     | 1.10                    |

### Highest Frequency

#### 20dB Bandwidth of Fundamental Emission



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### **Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:**

| Frequency Range<br>[MHz] | Quasi-Peak Limits<br>[ $\mu\text{V/m}$ ] |
|--------------------------|--|
| 30-88                    | 100                                      |
| 88-216                   | 150                                      |
| 216-960                  | 200                                      |
| Above 960                | 500                                      |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### **Results of Communication Mode(Lowest frequency): PASS**

| <b>Radiated Emissions<br/>Quasi-Peak</b> |                     |  |  |                                 |                                 |
|--|---------------------|--|--|---------------------------------|---------------------------------|
| Emission<br>Frequency<br>MHz             | E-Field<br>Polarity | Level<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Limit<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Level<br>@3m<br>$\mu\text{V/m}$ | Limit<br>@3m<br>$\mu\text{V/m}$ |
| 144.0                                    | Vertical            | 35.2                                     | 43.5                                     | 57.5                            | 150                             |
| 176.0                                    | Vertical            | 37.2                                     | 43.5                                     | 72.4                            | 150                             |
| 192.0                                    | Horizontal          | 32.3                                     | 43.5                                     | 41.2                            | 150                             |

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Correction Factor included Antenna Factor and Cable Attenuation.

|                                    |   |               |       |
|------------------------------------|---|---------------|-------|
| Calculated measurement uncertainty | : | 30MHz to 1GHz | 5.2dB |
|                                    |   | 1GHz to 18GHz | 5.1dB |

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### **Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:**

| Frequency Range<br>[MHz] | Quasi-Peak Limits<br>[ $\mu\text{V/m}$ ] |
|--------------------------|--|
| 30-88                    | 100                                      |
| 88-216                   | 150                                      |
| 216-960                  | 200                                      |
| Above 960                | 500                                      |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### **Results of Communication Mode(Middle frequency): PASS**

| <b>Radiated Emissions<br/>Quasi-Peak</b> |                     |  |  |                                 |                                 |
|--|---------------------|--|--|---------------------------------|---------------------------------|
| Emission<br>Frequency<br>MHz             | E-Field<br>Polarity | Level<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Limit<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Level<br>@3m<br>$\mu\text{V/m}$ | Limit<br>@3m<br>$\mu\text{V/m}$ |
| 144.0                                    | Vertical            | 35.2                                     | 43.5                                     | 57.5                            | 150                             |
| 176.0                                    | Vertical            | 37.2                                     | 43.5                                     | 72.4                            | 150                             |
| 192.0                                    | Horizontal          | 32.3                                     | 43.5                                     | 41.2                            | 150                             |

#### **Remarks:**

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Correction Factor included Antenna Factor and Cable Attenuation.

|                                    |   |               |       |
|------------------------------------|---|---------------|-------|
| Calculated measurement uncertainty | : | 30MHz to 1GHz | 5.2dB |
|                                    |   | 1GHz to 18GHz | 5.1dB |

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### **Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:**

| Frequency Range<br>[MHz] | Quasi-Peak Limits<br>[ $\mu\text{V/m}$ ] |
|--------------------------|--|
| 30-88                    | 100                                      |
| 88-216                   | 150                                      |
| 216-960                  | 200                                      |
| Above 960                | 500                                      |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### **Results of Communication Mode(Highest frequency): PASS**

| <b>Radiated Emissions<br/>Quasi-Peak</b> |                     |  |  |                                 |                                 |
|--|---------------------|--|--|---------------------------------|---------------------------------|
| Emission<br>Frequency<br>MHz             | E-Field<br>Polarity | Level<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Limit<br>@3m<br>$\text{dB}\mu\text{V/m}$ | Level<br>@3m<br>$\mu\text{V/m}$ | Limit<br>@3m<br>$\mu\text{V/m}$ |
| 144.0                                    | Vertical            | 35.2                                     | 43.5                                     | 57.5                            | 150                             |
| 176.0                                    | Vertical            | 37.2                                     | 43.5                                     | 72.4                            | 150                             |
| 192.0                                    | Horizontal          | 32.3                                     | 43.5                                     | 41.2                            | 150                             |

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Correction Factor included Antenna Factor and Cable Attenuation.

|                                    |   |               |       |
|------------------------------------|---|---------------|-------|
| Calculated measurement uncertainty | : | 30MHz to 1GHz | 5.2dB |
|                                    |   | 1GHz to 18GHz | 5.1dB |

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### **Appendix A**

#### **List of Measurement Equipment**

##### **Radiated Emission**

| <b>EQP NO.</b> | <b>DESCRIPTION</b>           | <b>MANUFACTURER</b> | <b>MODEL NO.</b> | <b>SERIAL NO.</b> | <b>LAST CAL</b> | <b>DUE CAL</b> |
|----------------|------------------------------|---------------------|------------------|-------------------|-----------------|----------------|
| EM062          | HORN ANTENNA                 | EMCO                | 3117             | 0075933           | 2008/11/06      | 2010/11/06     |
| EM215          | MULTIDEVICE CONTROLLER       | EMCO                | 2090             | 00024676          | N/A             | N/A            |
| EM216          | MINI MAST SYSTEM             | EMCO                | 2075             | 00026842          | N/A             | N/A            |
| EM217          | ELECTRIC POWERED<br>TURNABLE | EMCO                | 2088             | 00029144          | N/A             | N/A            |
| EM218          | ANECHOIC CHAMBER             | ETS-Linggren        | FACT-3           | --                | 2008/12/01      | 2011/12/01     |
| EM174          | BICONILOG ANTENNA            | EMCO                | 3142B            | 00029071          | 2008/01/24      | 2010/01/24     |
| EM229          | EMI TEST RECEIVER            | R&S                 | ESIB40           | 100248            | 2009/0927       | 2010/09/27     |
| EM022          | LOOP ANTENNA                 | EMCO                | 6502             | 1189-2424         | 2009/07/26      | 2011/07/26     |

Remarks:-

CM      Corrective Maintenance

N/A     Not Applicable or Not Available

TBD     To Be Determined

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### Appendix B

#### Duty Cycle Correction During 100msec

Each sample unit sends a different series of characters, but each pulse period (100msec) never exceeds a series of 40 sole (0.18msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $40 \times 0.18 \text{ msec} \text{ per } 100 \text{ msec} = 7.2\%$  duty cycle. Figure A through B show the characteristics of the pulse train for one of these functions.

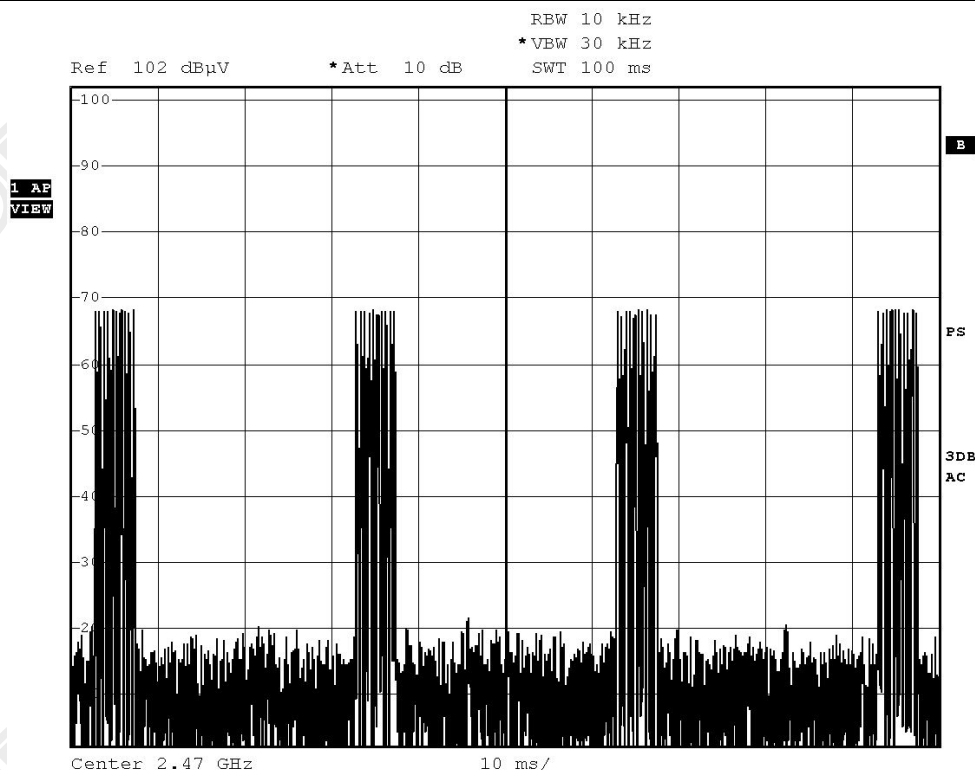
Remarks:

Duty Cycle Correction =  $20\text{Log}(0.072) = -23\text{dB}$

Duty Cycle Correction = -20dB, if the calculation duty cycle correction  $> -20\text{dB}$

The following figures [Figure A to Figure B] showed the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



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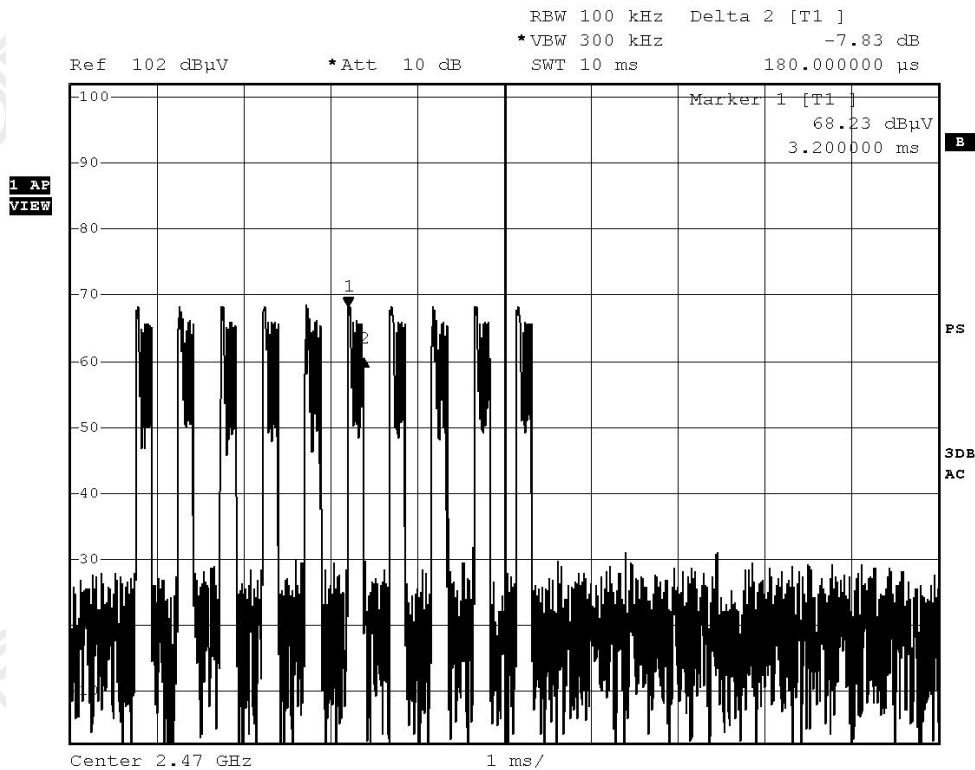
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Figure B [Sole Pulse]



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### **Appendix C**

#### **Photographs of EUT**

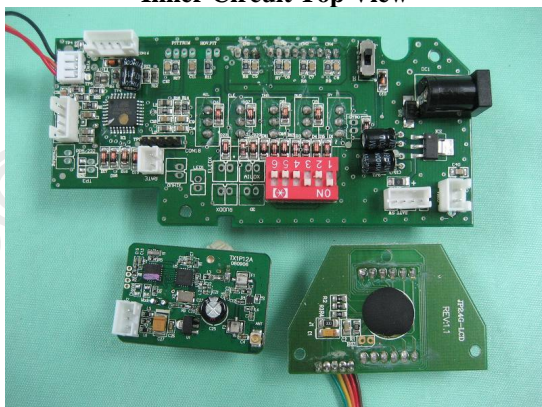
**Front View of the product**



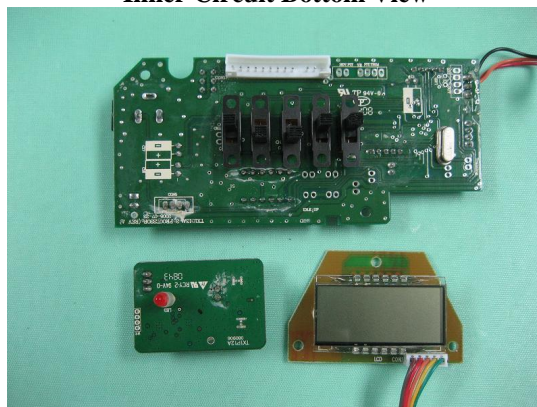
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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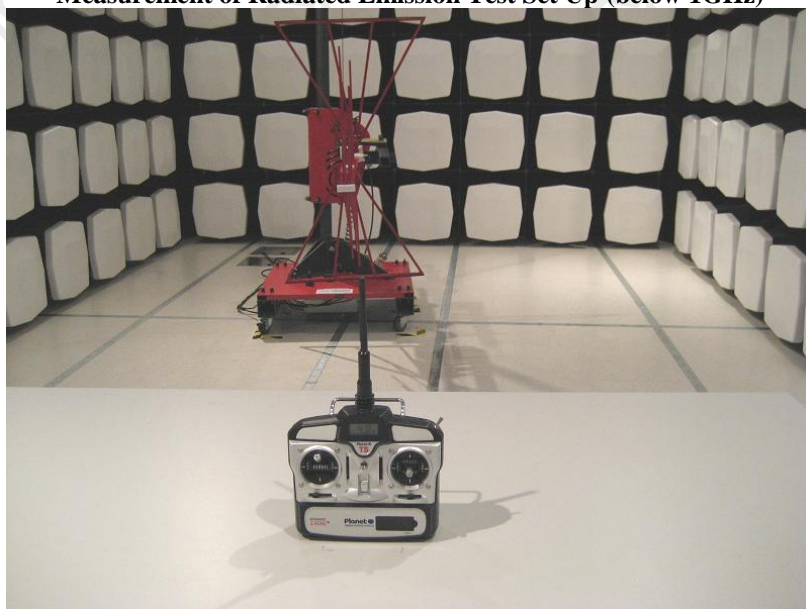
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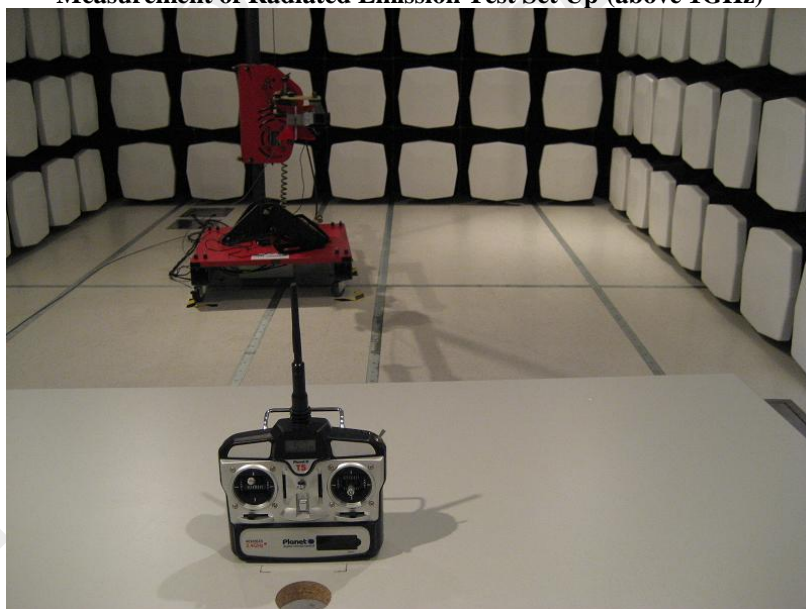
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### **Photographs of EUT**

**Measurement of Radiated Emission Test Set Up (below 1GHz)**



**Measurement of Radiated Emission Test Set Up (above 1GHz)**



**\*\*\*\*\* End of Test Report \*\*\*\*\***

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