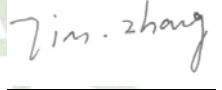
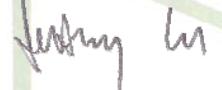




## FCC TEST REPORT

### 47 CFR FCC Part 15 Subpart C & 15.231

|  |  |
|--|--|
| FCC ID .....   | L5CW186TX-D  |
| Report Reference No.....   | WE11060007   |
| Compiled by<br>( position+printed name+signature)...   | File administrators Wenliang Li<br> |
| Supervised by<br>( position+printed name+signature)...   | Test Engineer Tim Zhang<br>         |
| Approved by<br>( position+printed name+signature)...   | Manager Jeffrey Lu<br>              |
| Date of issue.....   | Jun 17, 2011   |
| Testing Laboratory Name .....  | Shenzhen Huatongwei International Inspection Co., Ltd  |
| Address .....  | Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China   |
| Applicant's name.....  | Ansen Electronics Company  |
| Address .....  | ROOM 73-78,2/F., SINO INDUSTRIAL PLAZA, 9 KAL CHEUNG ROAD, KOWLOON BAY, KOWLOON, HONG KONG                             |
| Manufacturer's name .....  | Ansen Electronics Company  |
| Address .....  | Chen Tung Industrial Zone,Ning Tau Administrative District, Qiao Tau Zhen, Dongguan, Guangdong                         |
| <b>Test specification:</b>   |  |
| Standard .....   | 47 CFR FCC Part 15 Subpart C & 15.231<br>ANSI C63.10: 2009   |
| TRF Originator.....  | Shenzhen Huatongwei International Inspection CO., Ltd  |
| Master TRF.....  | Dated 2006-06  |
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| This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Huatongwei International Inspection Co., Ltd is acknowledged as copyright owner and source of the material. Shenzhen Huatongwei International Inspection Co., Ltd takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. |  |
| Equipment Under Test .....   | Weather station Transmitter  |
| Trade Mark .....   | /  |
| Model/Type reference.....  | W186-D   |
| Listed Models .....  | /  |
| Result.....  | Complied   |

## TEST REPORT

|                   |            |               |
|-------------------|------------|---------------|
| Test Report No. : | WE11060007 | Jun 17, 2011  |
|                   |            | Date of issue |

Equipment under Test : Weather station Transmitter

Model /Type : W186-D

Listed Models : /

**Applicant** : **Ansen Electronics Company**

Address : ROOM 73-78,2/F., SINO INDUSTRIAL PLAZA, 9 KAL CHEUNG ROAD, KOWLOON BAY, KOWLOON, HONG KONG

**Manufacturer** : **Ansen Electronics Company**

Address : Chen Tung Industrial Zone,Ning Tau Administrative District, Qiao Tau Zhen, Dongguan, Guangdong

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## 1. TEST STANDARDS

The tests were performed according to following standards:

[\*\*47 CFR FCC Part 15 Subpart C & 15.231\*\*](#) – Intentional Radiators & Periodic operation in the band 40.66–40.70 MHz and above 70 MHz

[\*\*ANSI C63.10: 2009\*\*](#) – American National Standard for Testing Unlicensed Wireless Devices

## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample : Jun 08, 2011

Testing commenced on : Jun 08, 2011

Testing concluded on : Jun 17, 2011

### 2.2. Equipment under test power supply

Power supply voltage :  120V / 60 Hz  115V / 60Hz  
 12 V DC  24 V DC  
 Other (specified in blank below)

DC 3V from battery

### 2.3. Short description of the Equipment under Test (EUT)

Product Name : Weather station Transmitter

Model Number : W186-D

Operation Frequency : 433.92MHz

Modulation Technology : ASK

Transmitter Type : Periodic Transmitter

Sample Type : Prototype

I/O Port : /

For more details, refer to the user's manual of the EUT.

### 2.4. EUT operation mode

The EUT has been tested under typical operating condition.

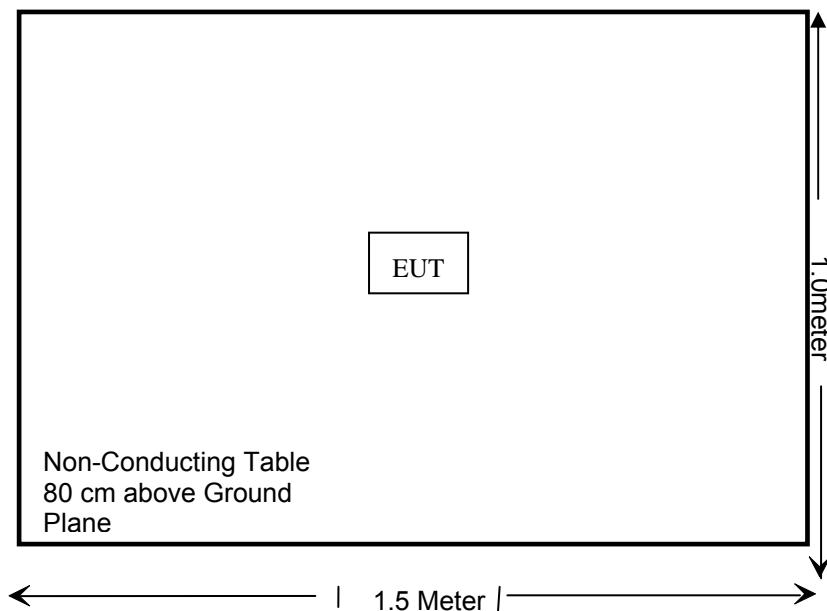
### 2.5. Related submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **L5CW186TX-D** filing to comply with the FCC Part 15, Subpart C Rules.

### 2.6. Modifications

No modifications were implemented to meet testing criteria.

## 2.7. Block Diagram of Test Setup



Note: For actual sample please see test setup photos and EUT external photos.

## 2.8. Summary of standards and result

| FCC Rules                                | Description of Test      | Result    |
|--|--------------------------|-----------|
| §15.207 (a)                              | Conducted Emissions      | N/A       |
| §15.205, §15.209, 15.35 (c), §15.231 (e) | Radiated Emissions       | Compliant |
| §15.231(e)                               | Deactivation Testing     | Compliant |
| §15.231(c)                               | 20 dB Band Width Testing | Compliant |
| §15.203                                  | Antenna Requirement      | Compliant |

NOTE: 1) The detailed test result please see section 4.  
2) The test report merely corresponds to the test sample.  
3) It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

Shenzhen Huatongwei International Inspection Co., Ltd  
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China  
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

#### **3.2. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

##### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: August 02, 2007. Valid time is until March 29, 2012.

##### **A2LA-Lab Cert. No. 2243.01**

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time to Sep 30, 2011.

##### **FCC-Registration No.: 662850**

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date July 01, 2009.

##### **IC-Registration No.: 5377**

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on Jan 24th, 2014.

##### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

##### **NEMKO-Aut. No.: ELA125**

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through July 07, 2011.

##### **VCCI**

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2009. Valid time is until December 19, 2012.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2009. Valid time is until December 19, 2012.

**DNV**

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until 24 Aug, 2013.

### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 22 ° C

Humidity: 65 %

Atmospheric pressure: 950-1050mbar

### 3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

| Test Item         | Frequency Range | Measurement Uncertainty | Notes |
|-------------------|-----------------|-------------------------|-------|
| Radiated Emission | 0.09~30MHz      | 3.85dB                  | (1)   |
| Radiated Emission | 30~1000MHz      | 4.22dB                  | (1)   |
| Radiated Emission | 1~12.75GHz      | 4.35dB                  | (1)   |
| 20dB Bandwidth    | /               | 0.25dB                  | (1)   |
| Deactivation Time | /               | 0.5ms                   | (1)   |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3.5. Equipments Used during the Test

| Conducted Emissions |                   |                 |           |            |            |
|---------------------|-------------------|-----------------|-----------|------------|------------|
| Item                | Test Equipment    | Manufacturer    | Model No. | Serial No. | Last Cal.  |
| 1                   | EMI Test Receiver | ROHDE & SCHWARZ | ESCI      | 100106     | 2010/10/24 |
| 2                   | Artificial Mains  | ROHDE & SCHWARZ | ESH2-Z5   | 100028     | 2010/10/24 |
| 3                   | Pulse Limiter     | ROHDE & SCHWARZ | ESHSZ2    | 100044     | 2010/10/24 |
| 4                   | EMI Test Software | ROHDE & SCHWARZ | ESK1      | N/A        | 2010/10/24 |

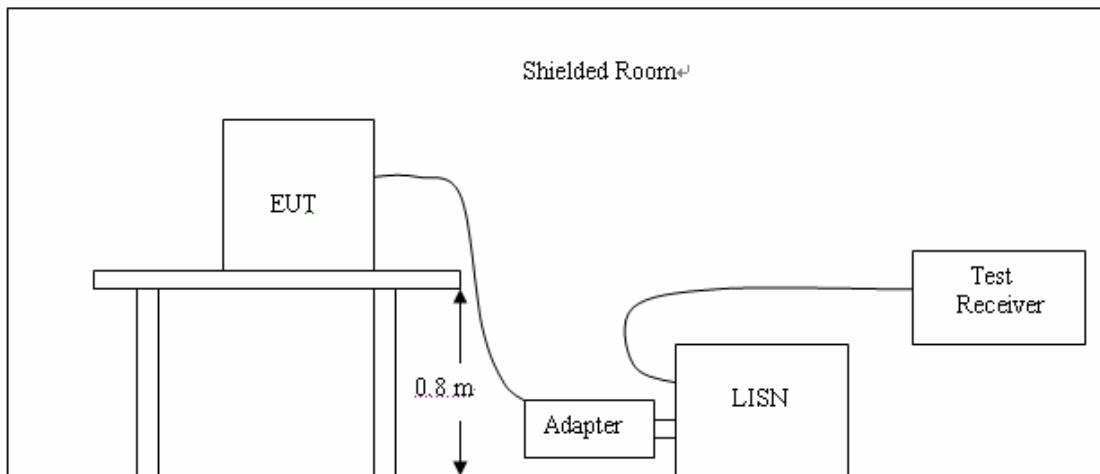
| Radiated Emissions |                                      |                 |                 |                |            |
|--------------------|--------------------------------------|-----------------|-----------------|----------------|------------|
| Item               | Test Equipment                       | Manufacturer    | Model No.       | Serial No.     | Last Cal.  |
| 1                  | ULTRA-BROADBAND ANTENNA              | ROHDE & SCHWARZ | HL562           | 100015         | 2010/10/24 |
| 2                  | Amplifier                            | Sonoma          | 310 N           | 291722         | 2010/10/24 |
| 3                  | EMI TEST RECEIVER                    | ROHDE & SCHWARZ | ESI 26          | 100009         | 2010/10/24 |
| 4                  | RF TEST PANEL                        | ROHDE & SCHWARZ | TS / RSP        | 335015/ 0017   | 2010/10/24 |
| 5                  | TURNTABLE                            | ETS             | 2088            | 2149           | 2010/10/24 |
| 6                  | ANTENNA MAST                         | ETS             | 2075            | 2346           | 2010/10/24 |
| 7                  | EMI TEST SOFTWARE                    | ROHDE & SCHWARZ | ESK1            | N/A            | 2010/10/24 |
| 8                  | Double-Ridged-Waveguide Horn Antenna | ROHDE & SCHWARZ | HF906           | 100039         | 2010/10/24 |
| 9                  | Amplifier                            | ROHDE & SCHWARZ | HF906 (1-18)GMZ | 00101800-28-5A | 2010/10/24 |
| 10                 | Loop Antenna                         | ROHDE & SCHWARZ | HFH2-Z2         | 100020         | 2010/10/24 |

| 20dB Bandwidth & Deactivation Time & Duty Cycle |                   |                 |           |            |            |
|---|-------------------|-----------------|-----------|------------|------------|
| Item  | Test Equipment    | Manufacturer    | Model No. | Serial No. | Last Cal.  |
| 1   | EMI Test Receiver | ROHDE & SCHWARZ | ESCI      | 100106     | 2010/10/24 |

## 4. TEST CONDITIONS AND RESULTS

### 4.1. AC Conducted Emission

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a Weather station Transmitter; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2 Support equipment, if needed, was placed as per ANSI C63.10.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4 All support equipments received AC power from a second LISN, if any.
- 5 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 6 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 7 During the above scans, the emissions were maximized by cable manipulation.

#### CONDUCTED LIMIT

According to FCC Subpart 15 B § 15.207 AC Conducted Emission Limits is as following :

| Frequency range<br>(MHz) | Conducted limit<br>(dB $\mu$ V) |           |
|--------------------------|---------------------------------|-----------|
|                          | Quasi-peak                      | Average   |
| 0.1~ 0.5                 | 66 to 56*                       | 56 to 46* |
| 0.5 ~ 5                  | 56                              | 46        |
| 5 ~ 30                   | 60                              | 50        |

\* Decreasing linearly with the logarithm of the frequency

#### TEST RESULTS

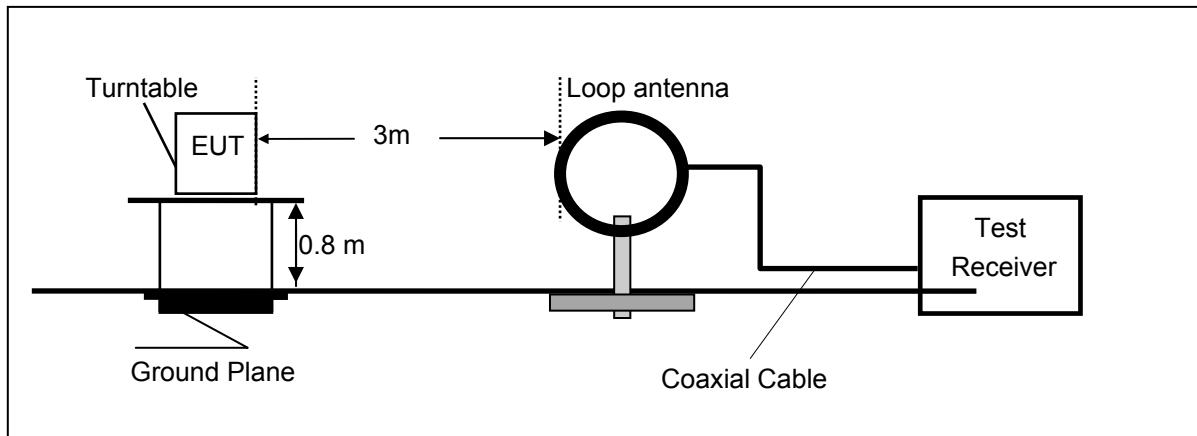
Not applicable to this device (because the equipment without any AC port)

## 4.2. Radiated Emission

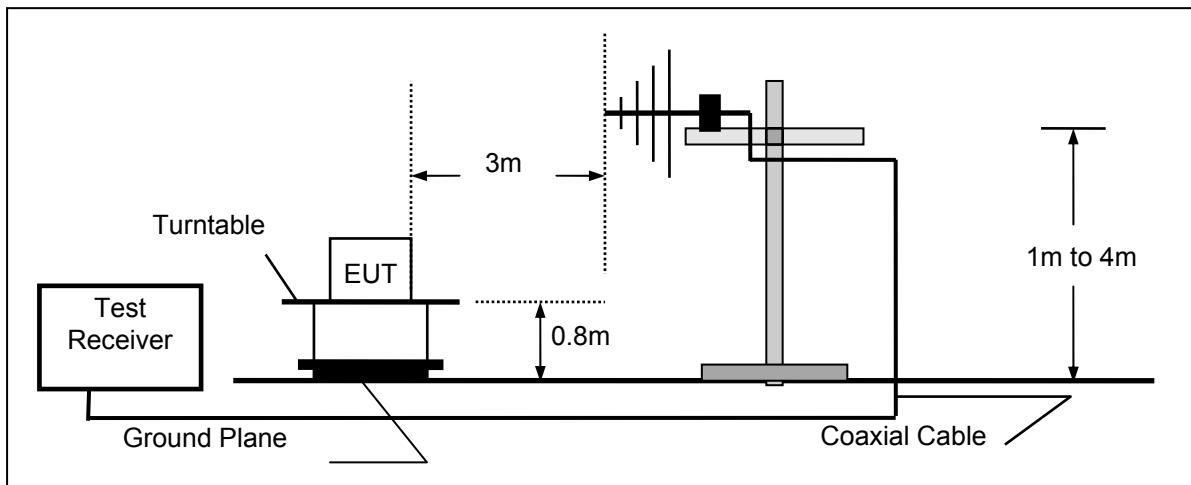
### TEST CONFIGURATION

Radiated Emission Test Set-Up

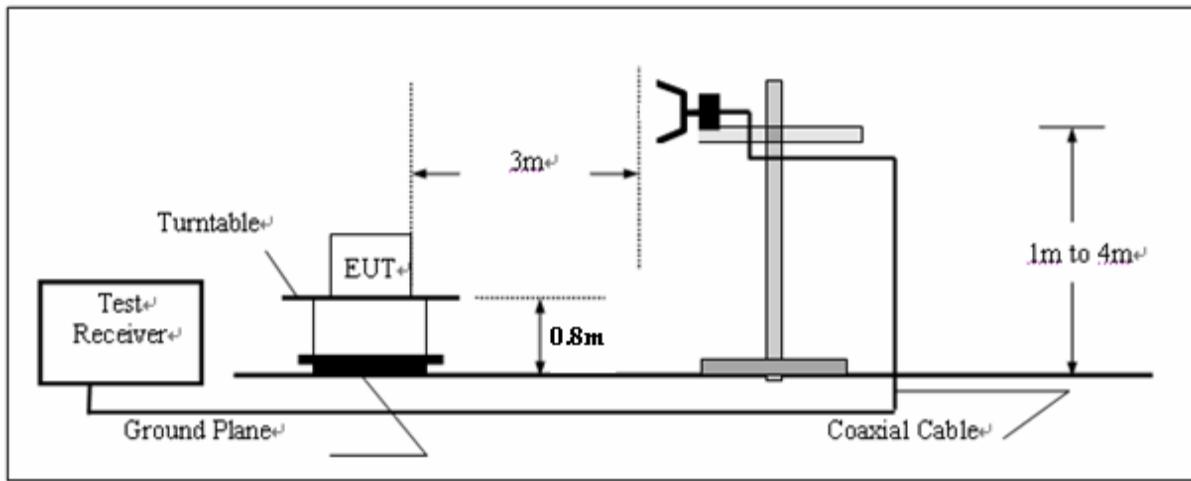
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range 1GHz – 5GHz



**TEST PROCEDURE**

- 1, The EUT was placed on a turn table which is 0.8m above ground plane, Put the battery into the EUT and the EUT will transmit automatic at 433.92MHz.
- 2, Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0 ° to 360 ° to acquire the highest emissions from EUT., each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 3, Repeat above procedures until all frequency measurements have been completed.

**EMI Test Receiver Setup**

The system was investigated from 9 KHz to 5 GHz.

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

| Frequency Range  | RBW     | VBW     | Dectector |
|------------------|---------|---------|-----------|
| 9kHz– 150kHz     | 200 Hz  | 1 kHz   | QP        |
| 150kHz– 30 MHz   | 9 KHz   | 30 KHz  | QP        |
| 30MHz – 1000 MHz | 100 kHz | 300 kHz | QP        |
| 1000 MHz – 5 GHz | 1 MHz   | 3 MHz   | PK        |
| 1000 MHz – 5 GHz | 1 MHz   | 10 Hz   | AV        |

Note: The measurement employ AV detector for the frequency bands 9KHz-90KHz and 110KHz-490KHz .

**RADIATION LIMIT**

For periodic transmitter, according to § 15.231(e), the field strength of fundamental from device at a distance of 3 meters shall not exceed the following values:

| Fundamental frequency (MHz) | Distance (Meters) | Field strength of fundamental |                |
|-----------------------------|-------------------|-------------------------------|----------------|
|                             |                   | ( $\mu$ V/m)                  | (dB $\mu$ V/m) |
| 40.66-40.70                 | 3                 | 1000                          | 60             |
| 70-130                      | 3                 | 500                           | 54             |
| 130-174                     | 3                 | 500 to 1500                   | 54 to 63.5     |
| 174-260                     | 3                 | 1500                          | 63.5           |
| 260-470                     | 3                 | 1500 to 5000                  | 63.5 to 74     |
| Above 470                   | 3                 | 5000                          | 74             |

For periodic transmitter, according to § 15.231(e), the field strength radiated emissions from device at a distance of 3 meters shall not exceed the following values:

| Fundamental frequency (MHz) | Distance (Meters) | Field strength of spurious emission |                |
|-----------------------------|-------------------|-------------------------------------|----------------|
|                             |                   | ( $\mu$ V/m)                        | (dB $\mu$ V/m) |
| 40.66-40.70                 | 3                 | 100                                 | 40             |
| 70-130                      | 3                 | 50                                  | 34             |
| 130-174                     | 3                 | 50 to 150                           | 34 to 43.5     |
| 174-260                     | 3                 | 150                                 | 43.5           |
| 260-470                     | 3                 | 150 to 500                          | 43.5 to 54     |
| Above 470                   | 3                 | 500                                 | 54             |

Note: 1, For other bands limit pls refer 15.209  
 2, The limit below 1GHz based CISPR quasi-peak detector, the limit above 1GHz based average detector and peak limit is 74dB $\mu$ V/m.

FCC Part 15B § 15.209, all spurious emissions shall comply with the limits of table as follow:

| Frequency (MHz) | Distance (Meters) | Radiated ( $\mu$ V/m) | Radiated (dB $\mu$ V/m) |
|-----------------|-------------------|-----------------------|-------------------------|
| 30-88           | 3                 | 100                   | 40.0                    |
| 88-216          | 3                 | 150                   | 43.5                    |
| 216-960         | 3                 | 200                   | 46.0                    |
| Above 960       | 3                 | 500                   | 54.0                    |

Note: The spurious emissions shall be attenuated to the average limits shown in above table or to the general limits shown in section 15.209, which limit permits a higher field strength.

## TEST RESULTS

The emissions from 30MHz to 5GHz are measured peak and average level, below 1Ghz measured QP level,detailed test data please see below.Besides,we tested 3 direction and recorded the worst data.

### Radiated emission of fundamental emission of Channel 1

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 433.92          | 79.46                               | 92.87                        | 13.41       | PK       | Horizontal   |
| 433.92          | 62.28                               | 72.87                        | 10.59       | AV       | Horizontal   |
| 433.92          | 87.20                               | 92.87                        | 5.67        | PK       | Vertical     |
| 433.92          | 70.02                               | 72.87                        | 2.85        | AV       | Vertical     |

**Spurious radiated emission of Channel 1**

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 0.16            | 61.56                               | 83.52                        | 21.96       | PK       | /            |
| 0.16            | 44.38                               | 63.52                        | 19.14       | AV       | /            |
| 10.74           | 36.56                               | 49.54                        | 12.98       | QP       | /            |
| 141.80          | 31.75                               | 40.00                        | 8.25        | QP       | Horizontal   |
| 345.37          | 29.47                               | 46.00                        | 16.53       | QP       | Horizontal   |
| 868.14          | 41.26                               | 72.87                        | 31.61       | PK       | Horizontal   |
| 868.14          | 24.08                               | 52.87                        | 28.79       | AV       | Horizontal   |
| 2170.34         | 43.09                               | 72.87                        | 29.78       | PK       | Horizontal   |
| 2170.34         | 25.91                               | 52.87                        | 26.96       | AV       | Horizontal   |
| 3036.07         | 46.73                               | 72.87                        | 26.14       | PK       | Horizontal   |
| 3036.07         | 29.55                               | 52.87                        | 23.32       | AV       | Horizontal   |
| 142.43          | 26.64                               | 40.00                        | 13.36       | QP       | Vertical     |
| 345.37          | 31.82                               | 46.00                        | 14.18       | QP       | Vertical     |
| 868.13          | 40.26                               | 72.87                        | 32.61       | PK       | Vertical     |
| 868.13          | 23.08                               | 52.87                        | 29.79       | AV       | Vertical     |
| 2170.34         | 49.58                               | 72.87                        | 23.29       | AV       | Horizontal   |
| 2170.34         | 32.40                               | 52.87                        | 20.47       | AV       | Vertical     |
| 3036.07         | 46.83                               | 72.87                        | 26.04       | PK       | Vertical     |
| 3036.07         | 29.65                               | 52.87                        | 23.22       | AV       | Vertical     |

**Radiated emission of fundamental emission of Channel 2**

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 433.92          | 79.32                               | 92.87                        | 13.55       | PK       | Horizontal   |
| 433.92          | 62.42                               | 72.87                        | 10.45       | AV       | Horizontal   |
| 433.92          | 87.06                               | 92.87                        | 5.81        | PK       | Vertical     |
| 433.92          | 70.16                               | 72.87                        | 2.71        | AV       | Vertical     |

**Spurious radiated emission of Channel 2**

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 0.16            | 61.27                               | 83.52                        | 22.25       | PK       | /            |
| 0.16            | 44.37                               | 63.52                        | 19.15       | AV       | /            |
| 10.74           | 36.70                               | 49.54                        | 12.84       | QP       | /            |
| 141.80          | 31.59                               | 40.00                        | 8.41        | QP       | Horizontal   |
| 345.37          | 30.25                               | 46.00                        | 15.75       | QP       | Horizontal   |
| 868.14          | 41.79                               | 72.87                        | 31.08       | PK       | Horizontal   |
| 868.14          | 24.89                               | 52.87                        | 27.98       | AV       | Horizontal   |
| 2170.34         | 43.16                               | 72.87                        | 29.71       | PK       | Horizontal   |
| 2170.34         | 25.72                               | 52.87                        | 27.15       | AV       | Horizontal   |
| 3036.07         | 47.14                               | 72.87                        | 25.73       | PK       | Horizontal   |
| 3036.07         | 30.24                               | 52.87                        | 22.63       | AV       | Horizontal   |
| 142.43          | 27.16                               | 40.00                        | 12.84       | QP       | Vertical     |
| 345.37          | 31.57                               | 46.00                        | 14.43       | QP       | Vertical     |
| 868.13          | 40.27                               | 72.87                        | 32.6        | PK       | Vertical     |
| 868.13          | 23.37                               | 52.87                        | 29.5        | AV       | Vertical     |
| 2170.34         | 50.45                               | 72.87                        | 22.42       | PK       | Horizontal   |
| 2170.34         | 33.55                               | 52.87                        | 19.32       | AV       | Vertical     |
| 3036.07         | 46.86                               | 72.87                        | 26.01       | PK       | Vertical     |
| 3036.07         | 29.96                               | 52.87                        | 22.91       | AV       | Vertical     |

**Radiated emission of fundamental emission of Channel 3**

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 433.92          | 79.25                               | 92.87                        | 13.62       | PK       | Horizontal   |
| 433.92          | 62.07                               | 72.87                        | 10.8        | AV       | Horizontal   |
| 433.92          | 87.02                               | 92.87                        | 5.85        | PK       | Vertical     |
| 433.92          | 69.84                               | 72.87                        | 3.03        | AV       | Vertical     |

## Spurious radiated emission of Channel 3

| Frequency (MHz) | Corrected Reading (dB $\mu$ V/m)@3m | FCC Limit (dB $\mu$ V/m) @3m | Margin (dB) | Detector | Polarization |
|-----------------|-------------------------------------|------------------------------|-------------|----------|--------------|
| 0.16            | 61.99                               | 83.52                        | 21.53       | PK       | /            |
| 0.16            | 44.81                               | 63.52                        | 18.71       | AV       | /            |
| 10.74           | 36.59                               | 49.54                        | 12.95       | QP       | /            |
| 141.80          | 31.30                               | 40.00                        | 8.7         | QP       | Horizontal   |
| 345.37          | 29.90                               | 46.00                        | 16.1        | QP       | Horizontal   |
| 868.14          | 41.25                               | 72.87                        | 31.62       | PK       | Horizontal   |
| 868.14          | 24.07                               | 52.87                        | 28.8        | AV       | Horizontal   |
| 2170.34         | 42.90                               | 72.87                        | 29.97       | PK       | Horizontal   |
| 2170.34         | 25.72                               | 52.87                        | 27.15       | AV       | Horizontal   |
| 3036.07         | 46.89                               | 72.87                        | 25.98       | PK       | Horizontal   |
| 3036.07         | 29.71                               | 52.87                        | 23.16       | AV       | Horizontal   |
| 142.43          | 26.90                               | 40.00                        | 13.1        | QP       | Vertical     |
| 345.37          | 31.70                               | 46.00                        | 14.3        | QP       | Vertical     |
| 868.13          | 39.90                               | 72.87                        | 32.97       | PK       | Vertical     |
| 868.13          | 22.72                               | 52.87                        | 30.15       | AV       | Vertical     |
| 2170.34         | 50.37                               | 72.87                        | 22.5        | PK       | Horizontal   |
| 2170.34         | 33.19                               | 52.87                        | 19.68       | AV       | Vertical     |
| 3036.07         | 46.60                               | 72.87                        | 26.27       | PK       | Vertical     |
| 3036.07         | 29.42                               | 52.87                        | 23.45       | AV       | Vertical     |

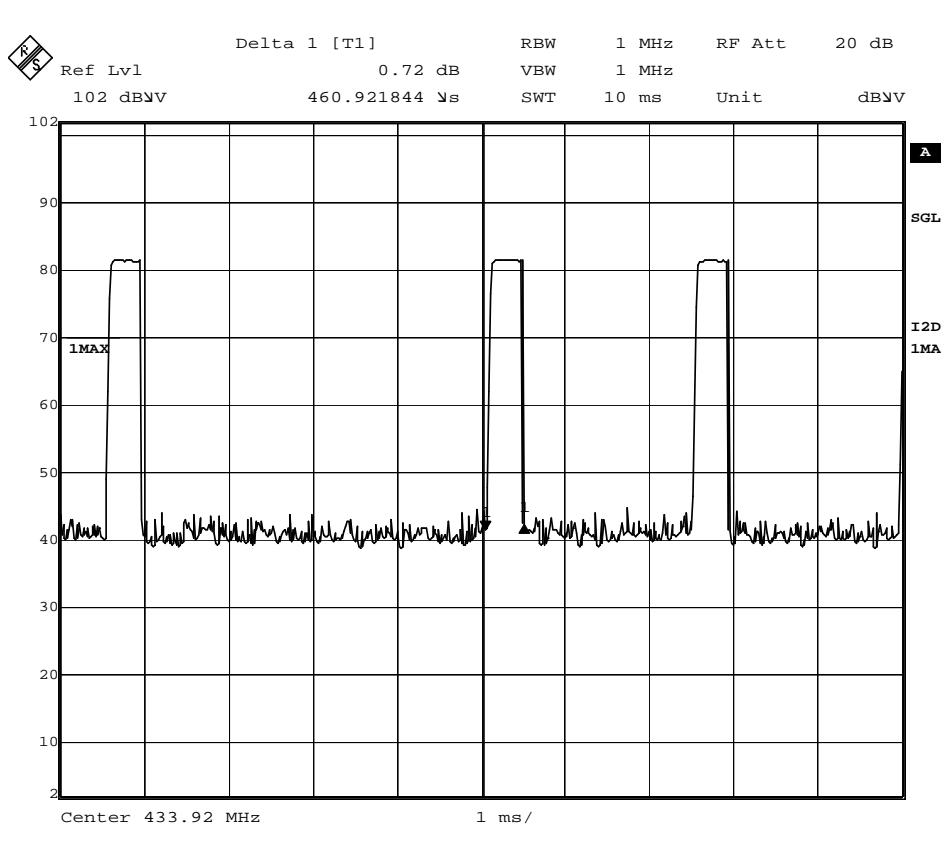
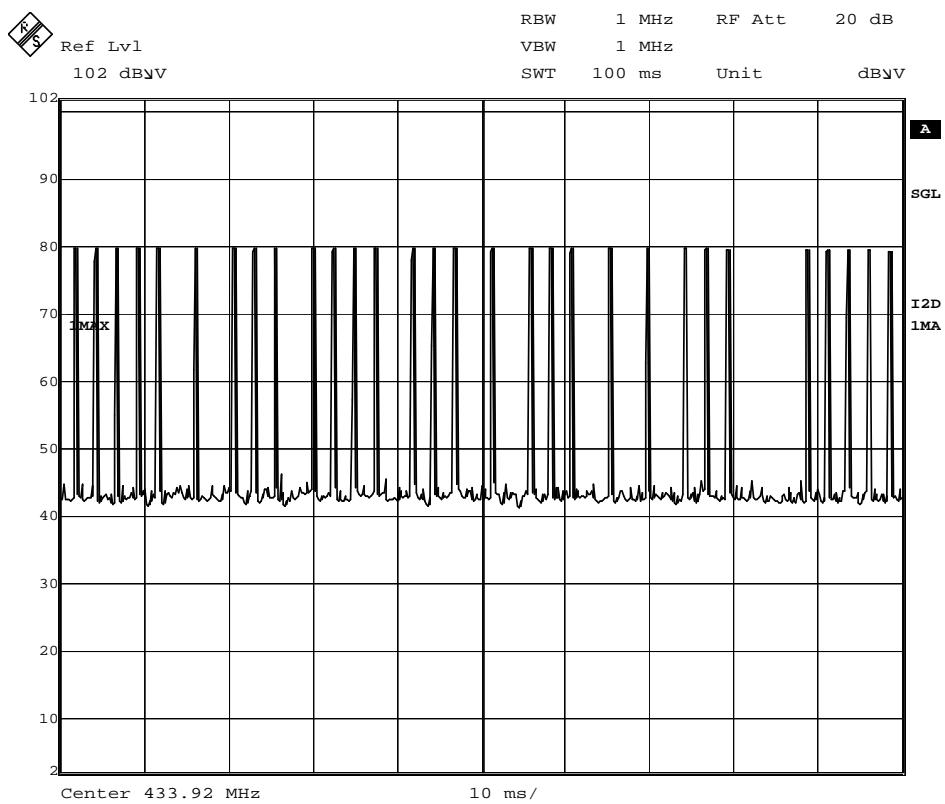
Note 1: According to section 15.35(b), when average radiated emission measurements are specified, including emission measurement below 1000MHz, there also is limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated.

Note 2: Average Result =Peak Field Strength+Duty Cycle Correction Factor.

Note 3: Duty Cycle Correction Factor value refers to below.

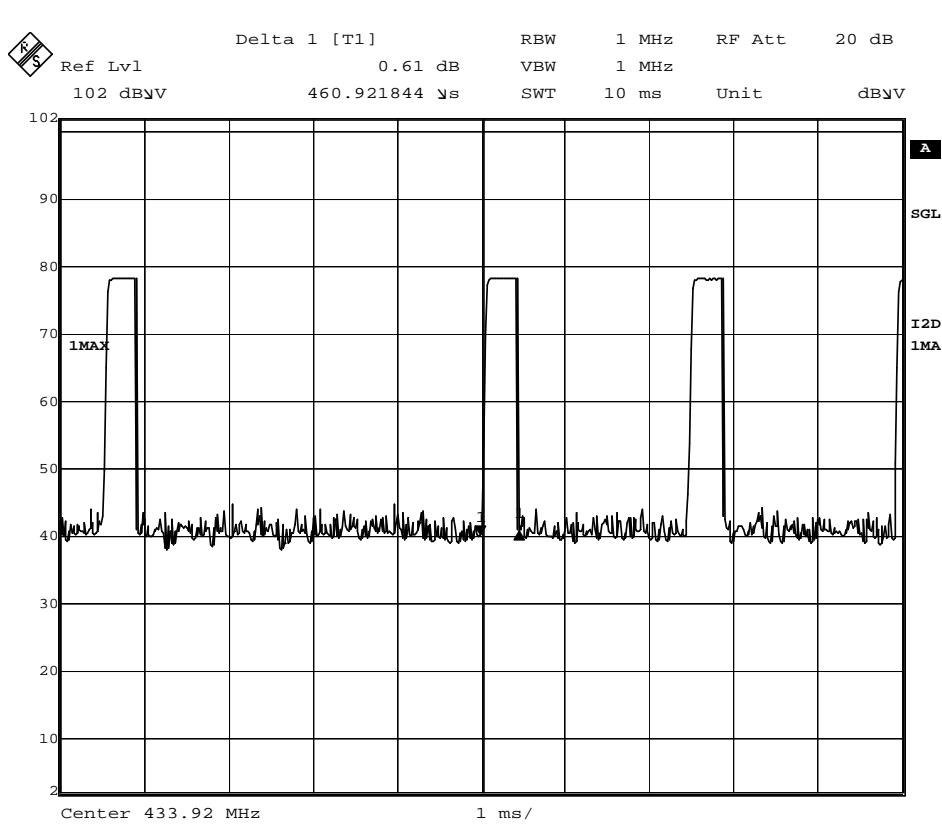
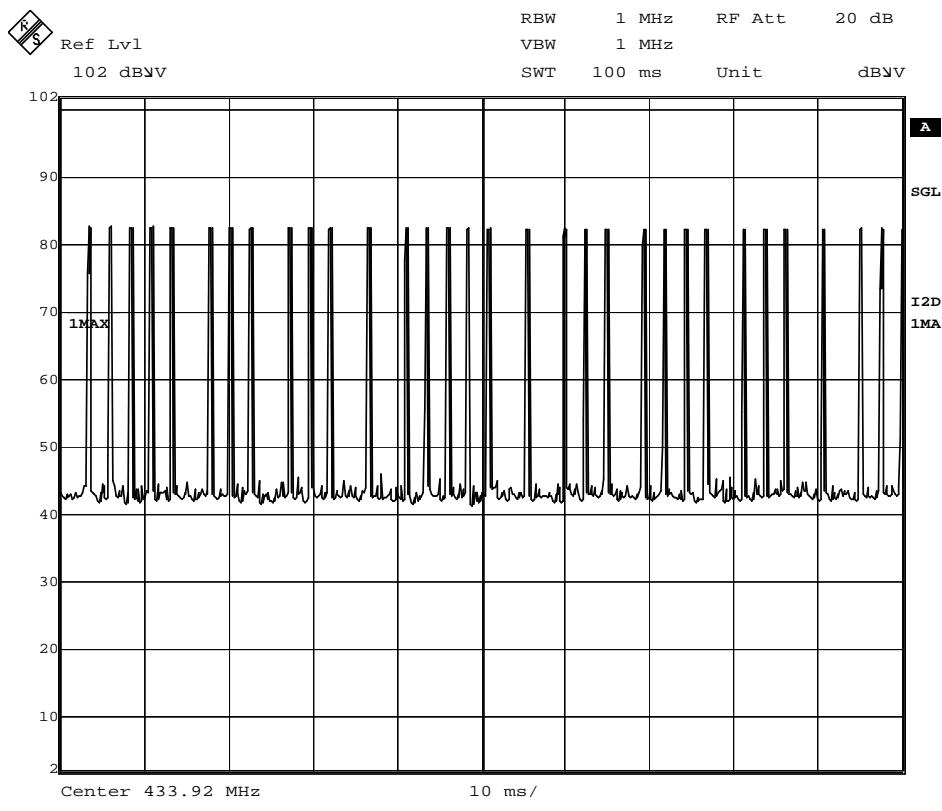
Duty Cycle Correction FactorChannel 1

Total pulse on time: 0.461 millisecond

Duty Cycle = TX on/100ms X 100% =  $0.461*30 \text{ ms}/100\text{ms} \times 100\% = 13.83\%$ Duty Cycle Correction Factor =  $20\log(\text{Duty Cycle}) = -17.18$ 

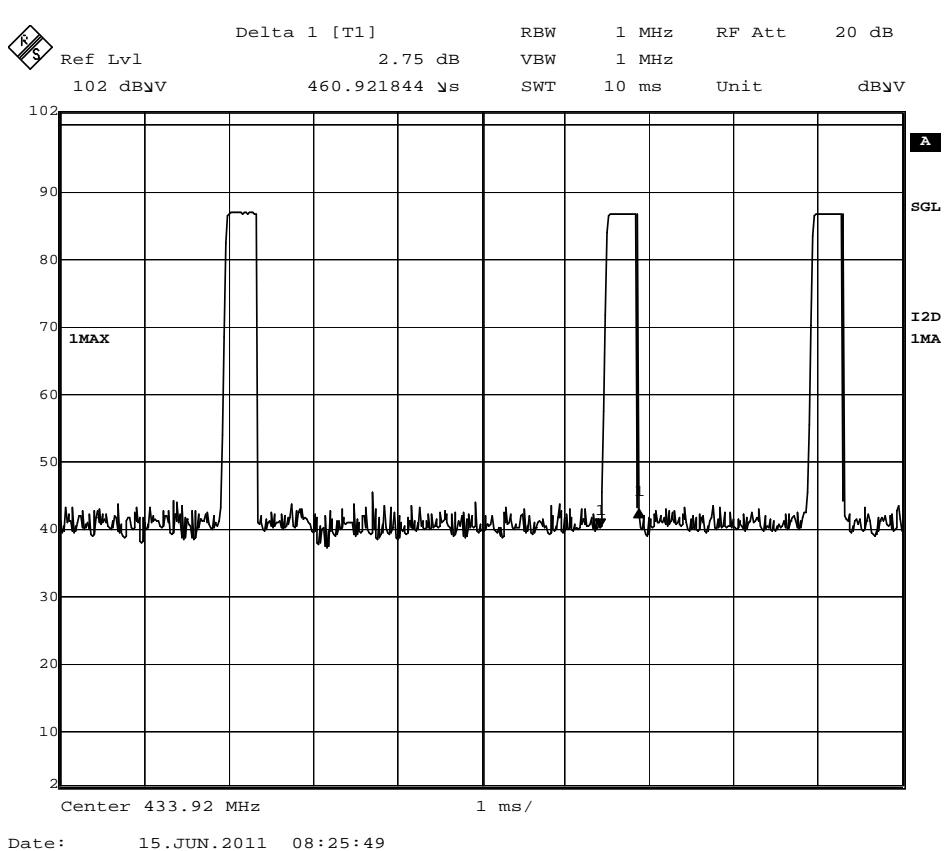
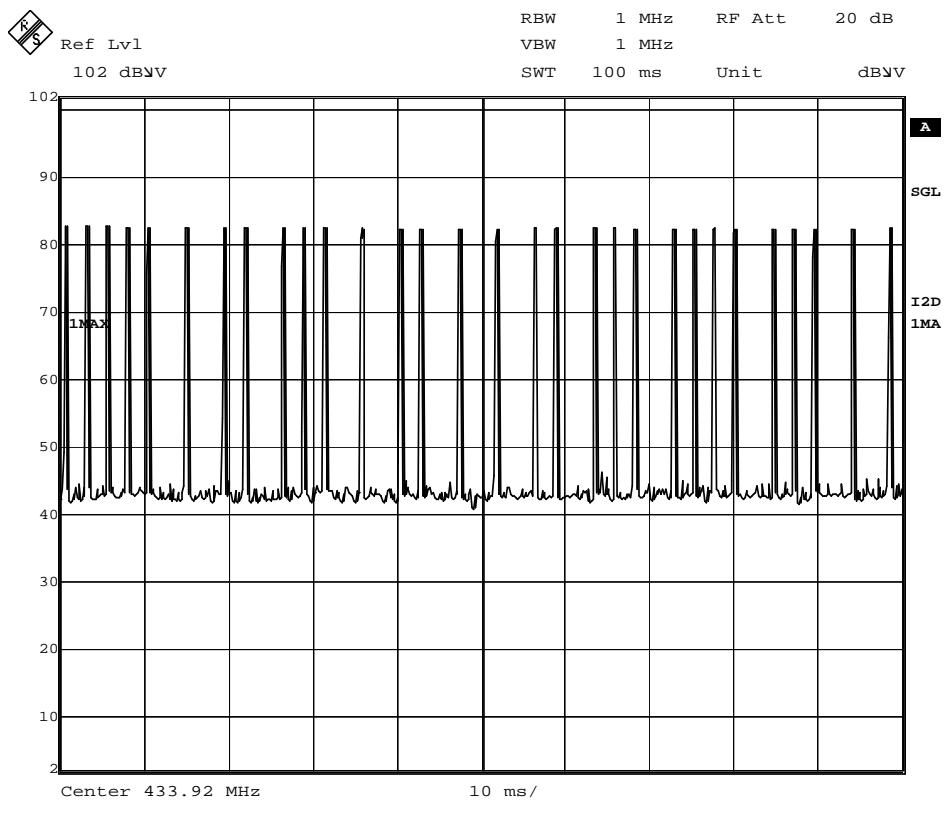
Channel 2

Total pulse on time:0.461 millisecond  
 Duty Cycle = TX on/100ms X 100% =  $0.461*31 \text{ ms}/100\text{ms} \times 100\% = 14.29\%$   
 Duty Cycle Correction Factor =  $20\log(\text{Duty Cycle}) = -16.90$



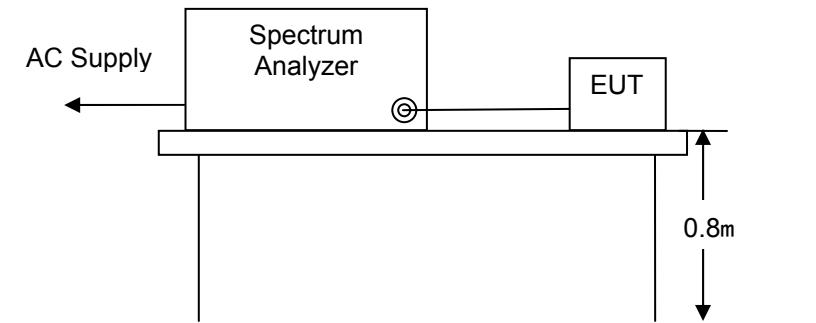
Channel 3

Total pulse on time:0.461 millisecond  
 Duty Cycle = TX on/100ms X 100% =  $0.461*30\text{ ms}/100\text{ms} \times 100\% = 13.83\%$   
 Duty Cycle Correction Factor =  $20\log(\text{Duty Cycle}) = -17.18$



### 4.3. Deactivation Time

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was set to 1 MHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

#### Limit

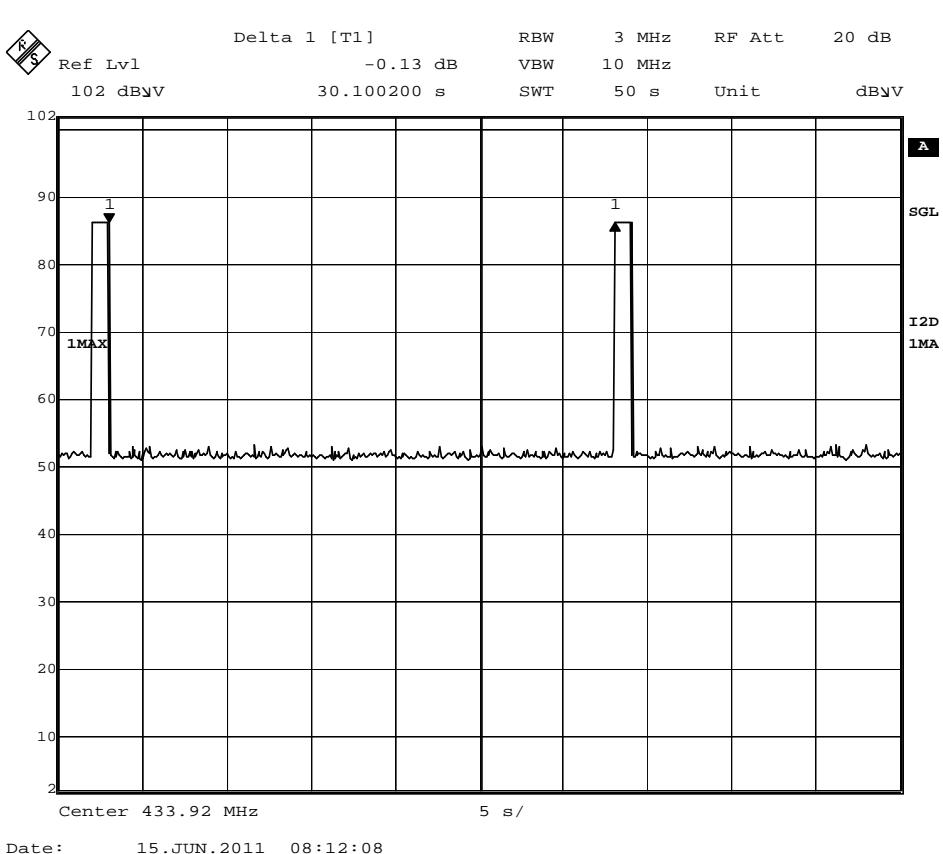
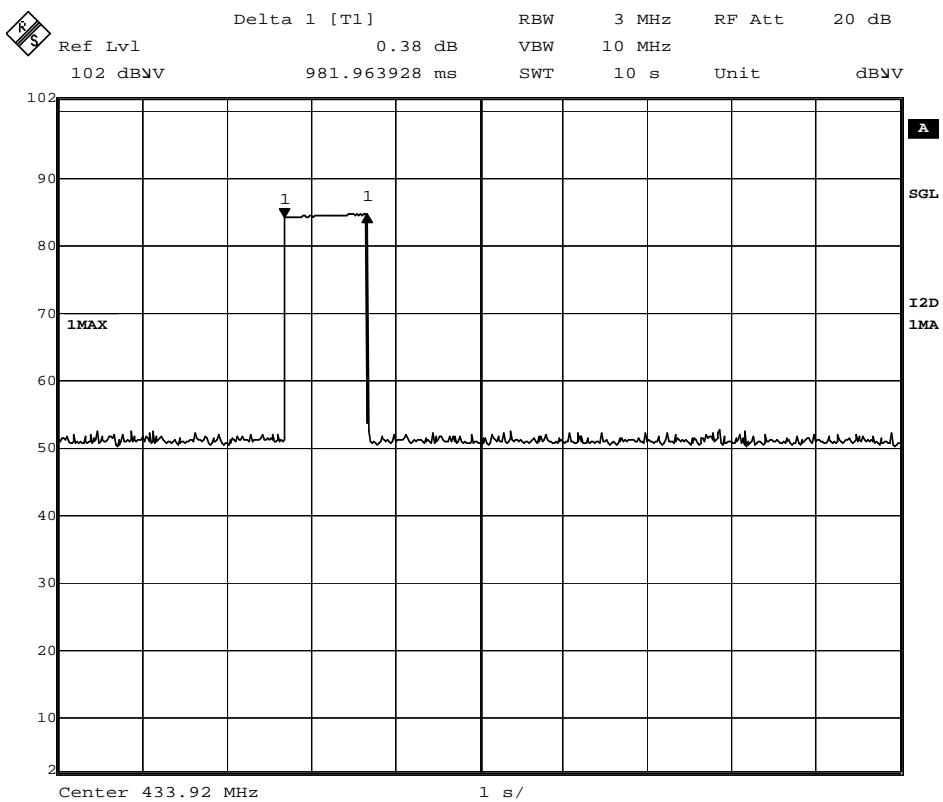
For periodic transmitter, according to FCC Part 15C § 15.231(e)

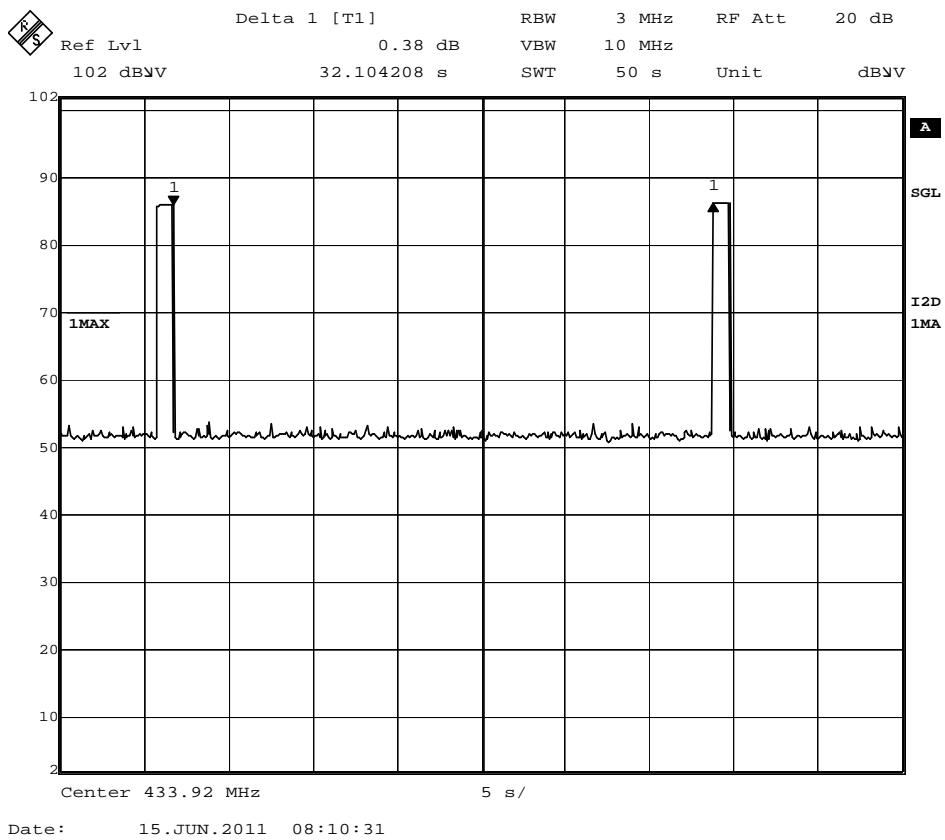
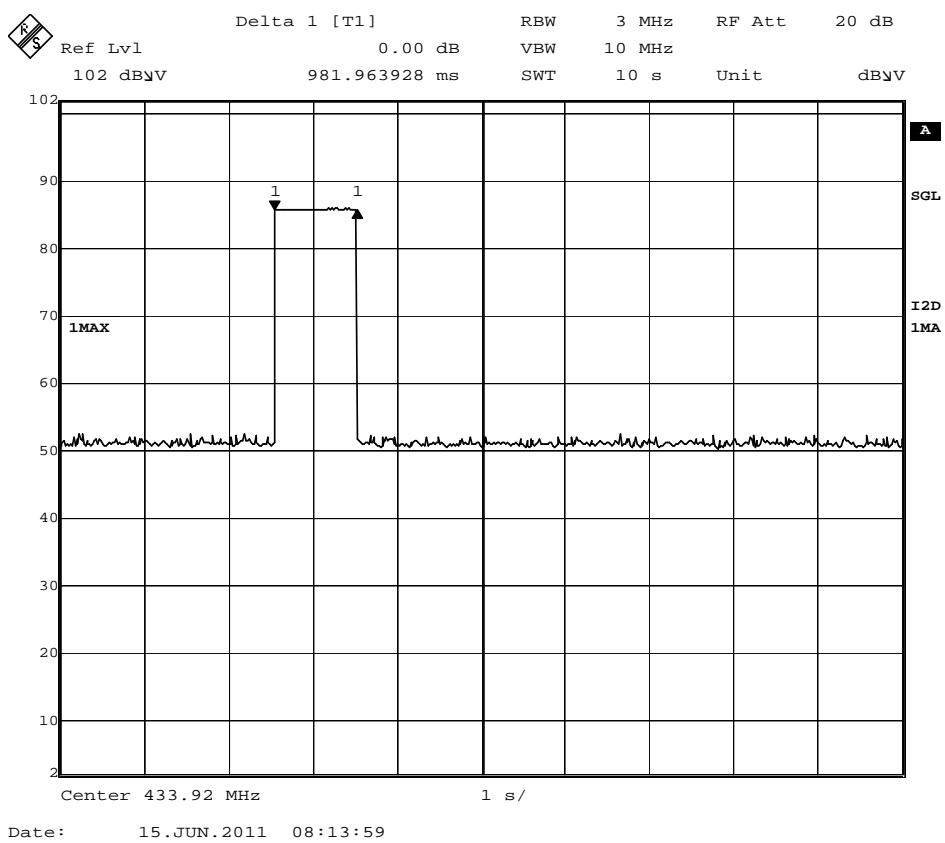
| Item                  | Limit<br>(second)   |
|-----------------------|---|
| One transmission time | not greater than 1 second   |
| Transmission period   | at least 30 times the duration of the transmission but in no case less than 10 second |

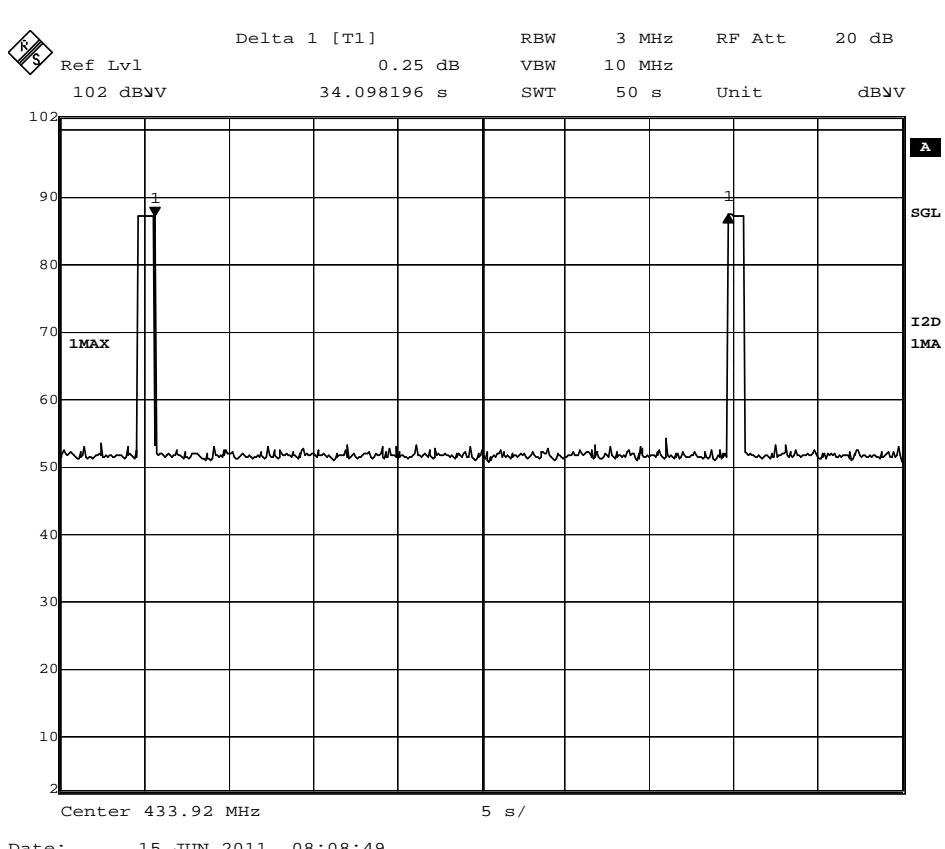
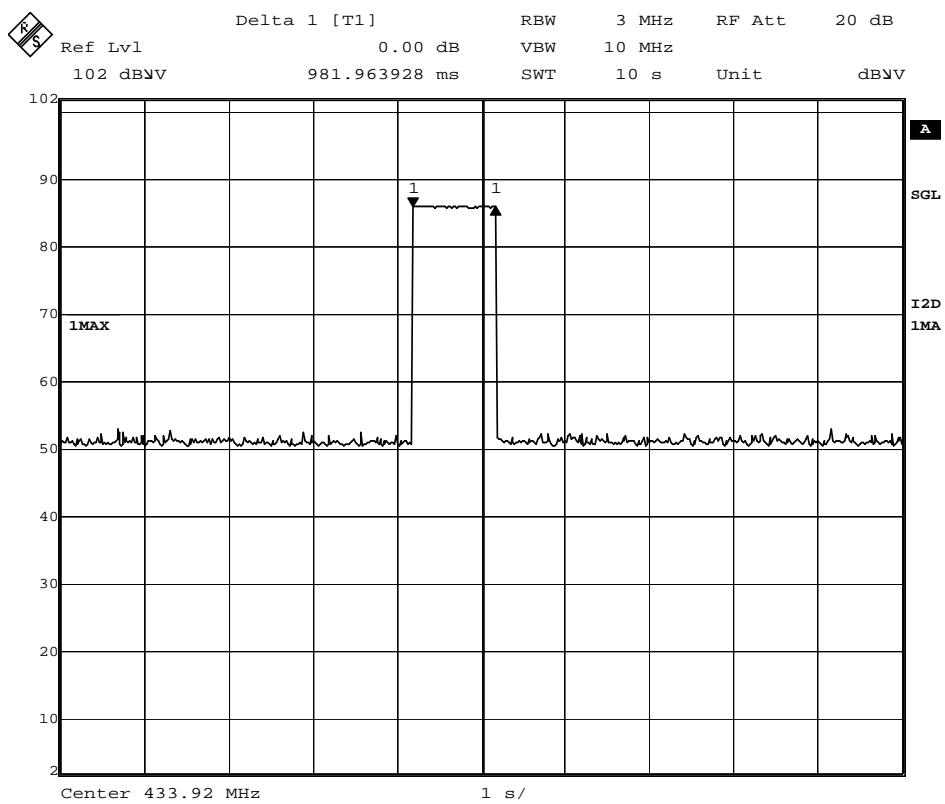
#### TEST RESULTS

EUT statement: The transmitter was automatically activated, and the carrier frequency 433.92MHz:

| Frequency<br>(MHz) | One transmission time<br>(second) | Transmission period<br>(second)   | Result |
|--------------------|-----------------------------------|-----------------------------------|--------|
| Channel1(433.92)   | 0.982                             | $0.982 \times 30 = 29.46 < 30.10$ | Pass   |
| Channel2(433.92)   | 0.982                             | $0.982 \times 30 = 29.46 < 32.10$ | Pass   |
| Channel3(433.92)   | 0.982                             | $0.982 \times 30 = 29.46 < 34.10$ | Pass   |

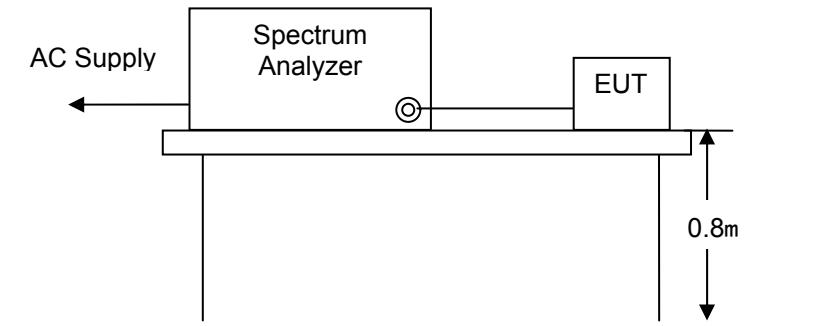
Channel 1

Channel 2

Channel 3

## 4.4. 20dB Bandwidth

### TEST CONFIGURATION



### TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 10 kHz and video bandwidth was set to 30 kHz to encompass all significant spectral components during the test. The detector was set to peak and hold mode to clearly observe the components.

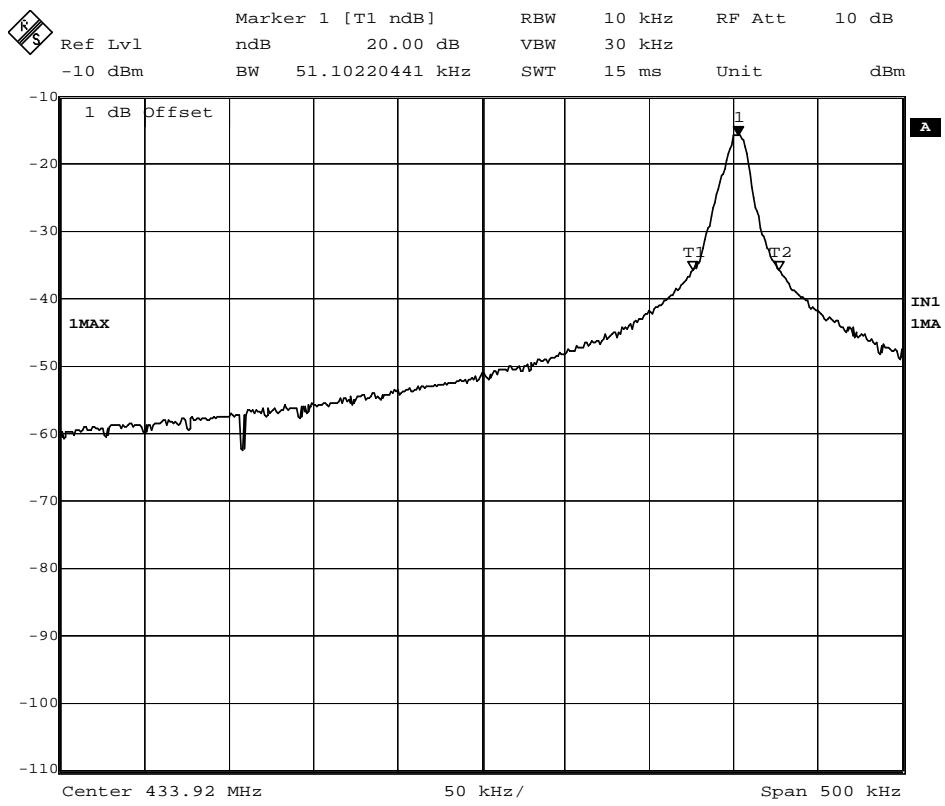
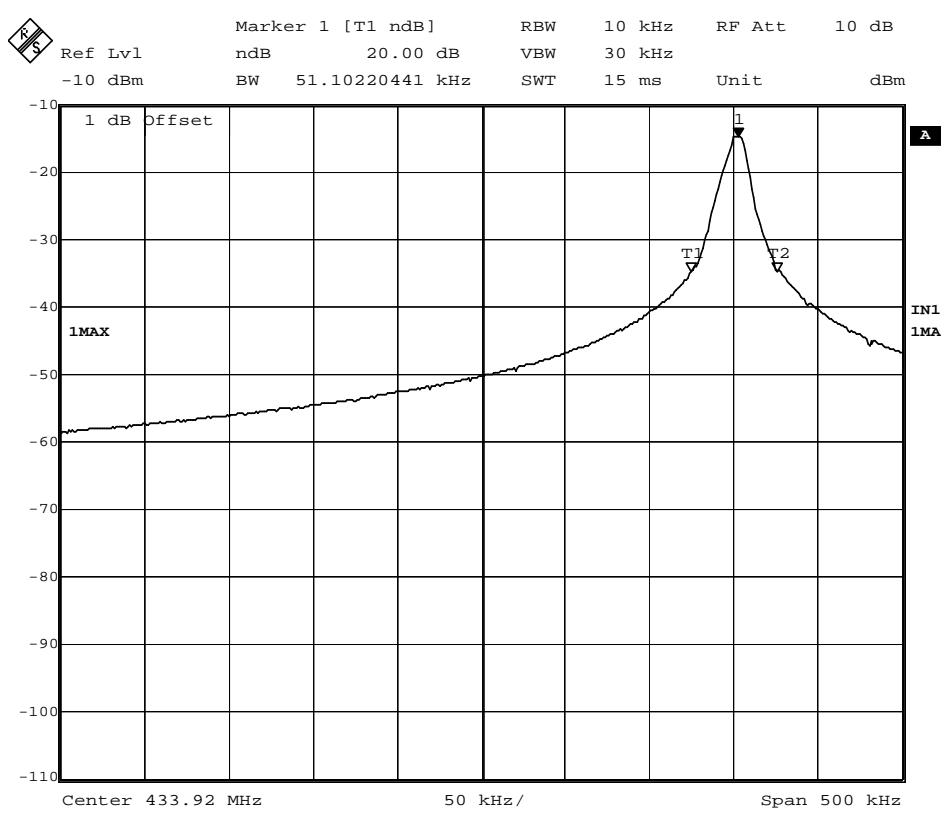
### Limit

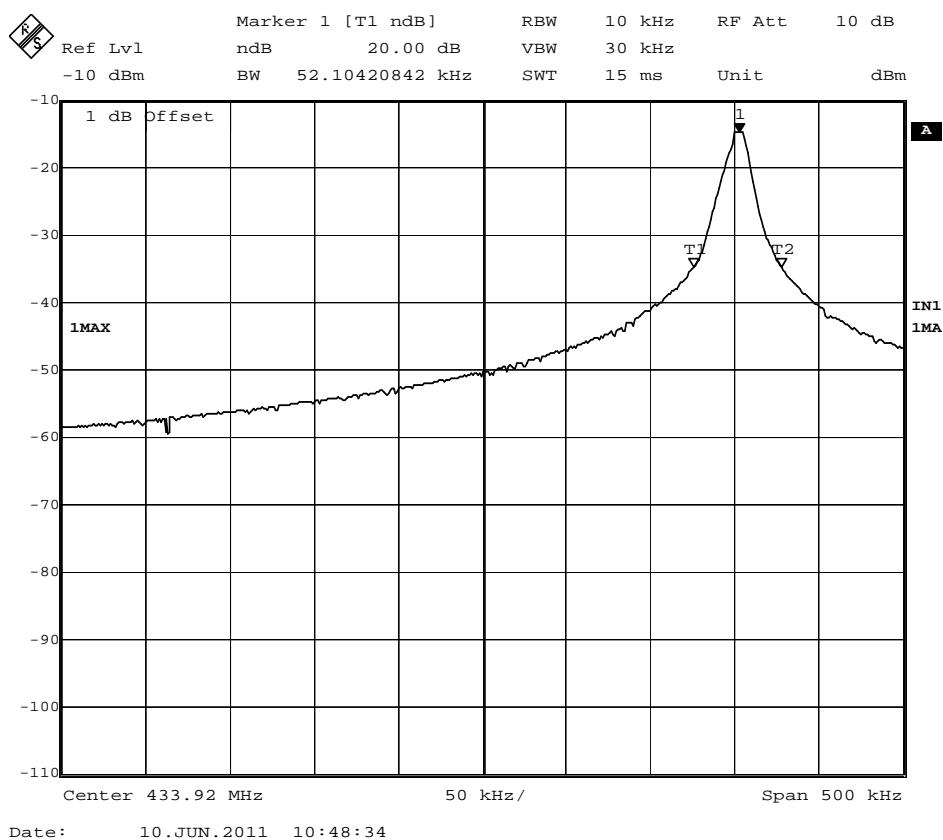
According to FCC Part 15C § 15.231(c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

### TEST RESULTS

| Frequency (MHz)   | 20dB Bandwidth Measurement Bandwidth (KHz) | Limit (kHz) | Result |
|-------------------|--|-------------|--------|
| Channel 1(433.92) | 51.10                                      | 1084.80     | Pass   |
| Channel 2(433.92) | 51.10                                      | 1084.80     | Pass   |
| Channel 3(433.92) | 52.10                                      | 1084.80     | Pass   |

20dB BandwidthChannel 1Channel 2

Channel 3

#### 4.5. Antenna Requirement

According to FCC Part 15C § 15.203,

- a), An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
- b), The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

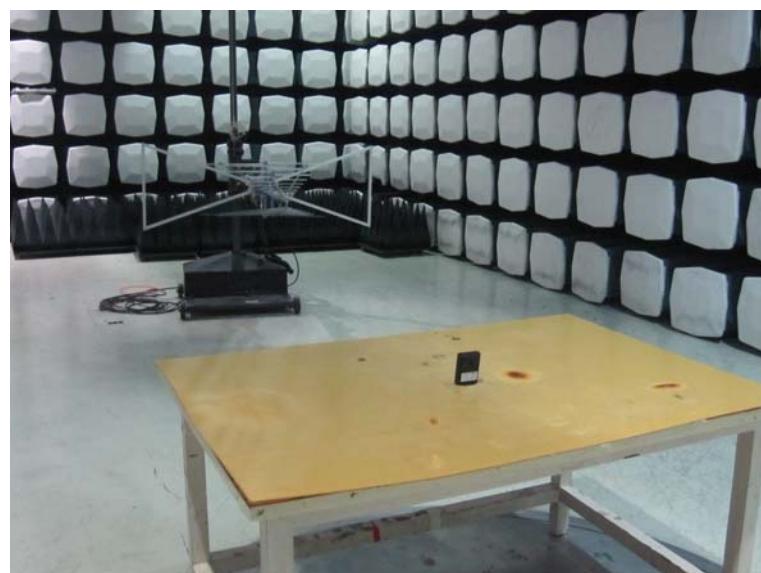
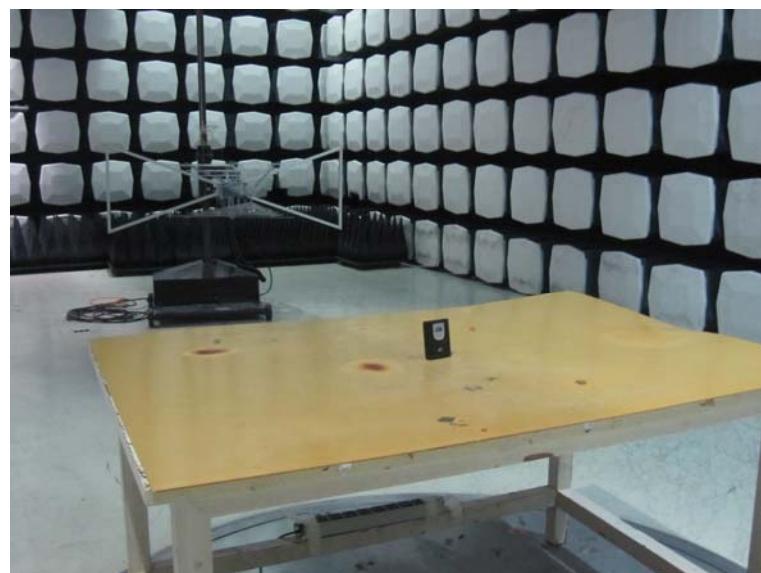
The EUT use of a Integral antenna. Please refer to the EUT Internal photos.

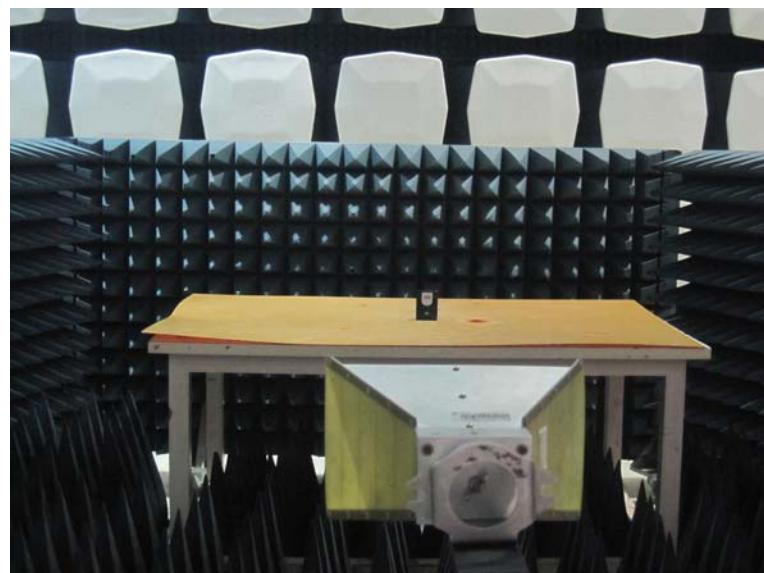
The EUT complied the antenna requirement.



## 5. Test Setup Photos of the EUT

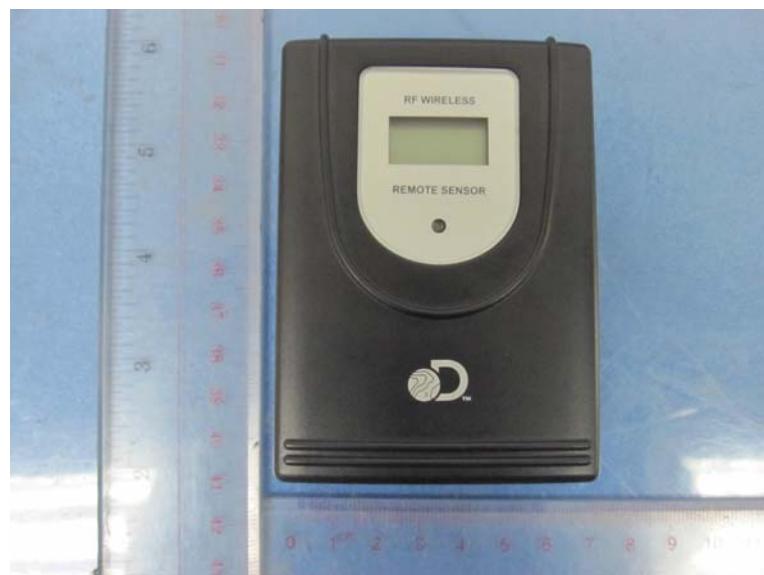
Radiated emission test photo





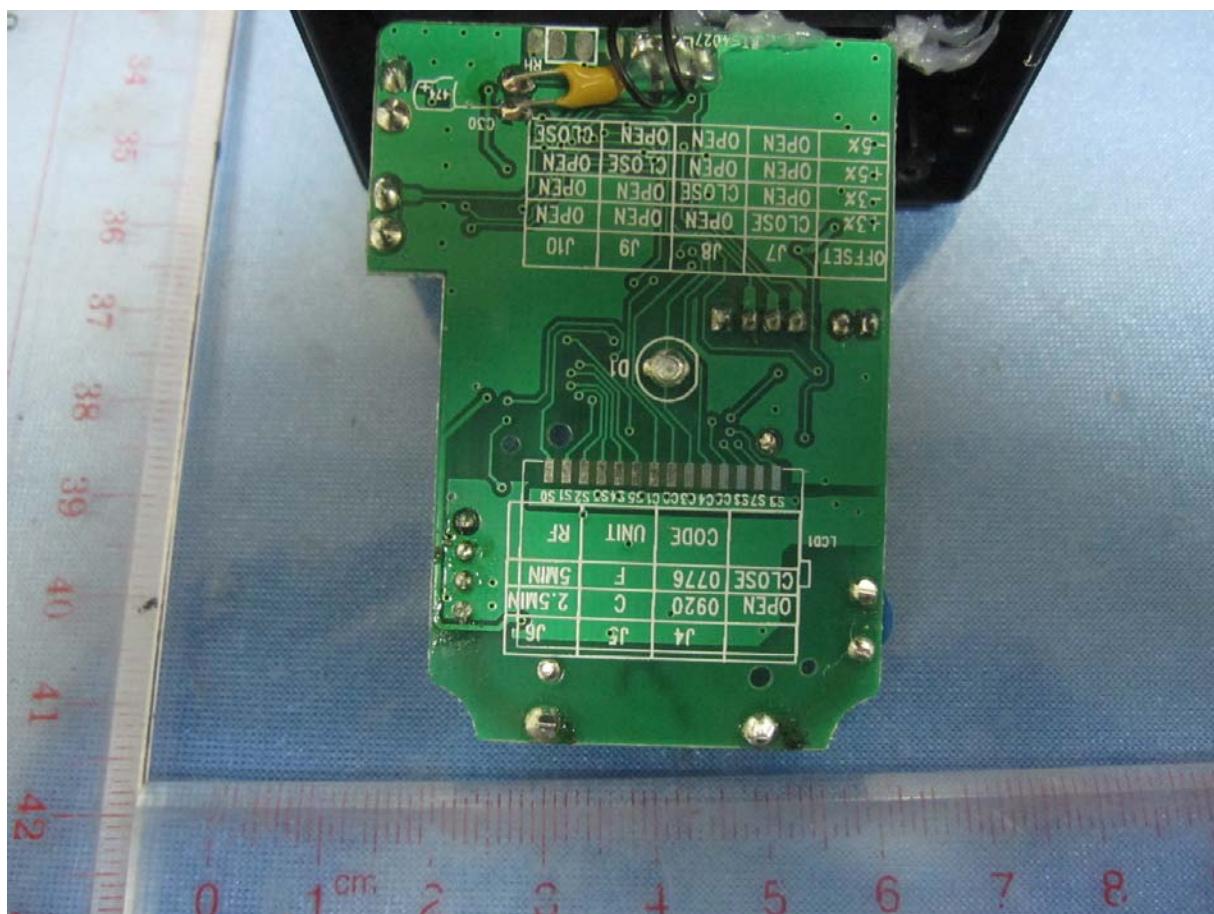
## 6. External and Internal Photos of the EUT

### External Photos&antenna photo





Internal Photos



.....End of Report.....