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FCC TEST REPORT

47 CFR FCC Part 15 Subpart C & 15.231

FCC ID: TWNZF01-C

Report Reference No.: WE10050015

Compiled by

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Date of issue.....: May 25, 2010

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: Pro-Lite, Inc.

Address: 3505 Cadillac Ave. Building D

Manufacturer's name: NINGBO YOUWON TECHNOLOGY ELECTRONICS CO., LTD

Address: #928, XUEYUAN ROAD, LUGANG VILLAGE, GAOQIAO TOWN, NINGBO

Test specification:

Standard: 47 CFR FCC Part 15 Subpart C & 15.231

ANSI C63.4: 2009

TRF Originator.....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF.....: Dated 2006-06

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Equipment Under Test: Wireless Module

Trade Mark: /

Model/Type reference.....: ZF01-C

Listed Models: /

Result.....: Complied

TEST REPORT

| | |
|-------------------------------------|---------------|
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SUMMARY OF STANDARDS AND RUSELT

| No. | Test Item | Test Standards and Procedure | Result |
|-----|-----------------------|--|----------|
| 1 | AC Conducted Emission | FCC Subpart 15C § 15.207 ANSI C63.4: 2009 § 13.3 | Complied |
| 2 | Radiated Emission | FCC Subpart 15C § 15.209 FCC Subpart 15C § 15.231(e) ANSI C63.4: 2009 § 13.4 | Complied |
| 3 | Deactivation Time | FCC Subpart 15C § 15.231(e) | Complied |
| 4 | 20dB Bandwidth | FCC Subpart 15C § 15.231(c) ANSI C63.4: 2009 § 13.7 | Complied |
| 5 | Antenna Requirement | FCC Subpart 15C § 15.203 | Complied |

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.

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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 C63.4: 2009 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : May 18, 2010

Testing commenced on : May 20, 2010

Testing concluded on : May 23, 2010

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 5V from PC

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

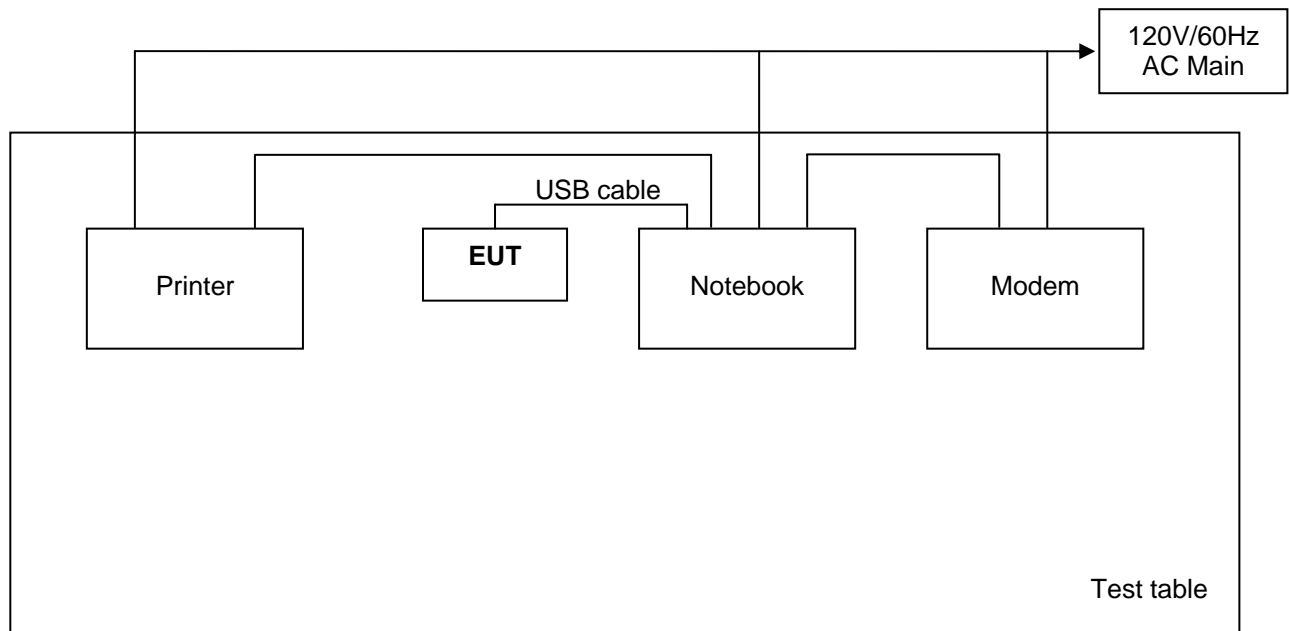
Product Name : Wireless Module
Model Number : ZF01-C
Operation Frequency : 433.05 MHz
Modulation Technology : GFSK
Transmitter Type : Periodic Transmitter
Sample Type : Prototype
Cable Length : 100 cm

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

2.4. EUT operation mode

The EUT has been tested under typical operating mode (TX mode).

2.5. Configuration of Tested System



Equipment Used in Tested System

| No. | Equipment | Manufacturer | Model No. | Serial No. |
|-----|-----------|--------------|----------------------|------------|
| 1 | Notebook | DELL | PP01L | 2F485A00 |
| 2 | Printer | HP | Laserjet 1000 series | / |
| 3 | Modem | D-Link | DI-524M | / |

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

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **TWNZF01-C** filing to comply with the FCC Part 15 Subpart C 15.231(e) Rules 2009.

2.7. Modifications

No modifications were implemented to meet testing criteria.

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 (2003) 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: Mar 30, 2009. Valid time is until Mar 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 is until Sept 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 Jun 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 November Feb 13, 2009. Valid time is until Feb 13, 2011.

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, 2006. Valid time is until December 20, 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, 2006. 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 Jul 09, 2010.

3.3. Environmental conditions

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

| | |
|-----------------------|---------------------|
| Temperature: | <u>22 ° C</u> |
| Humidity: | <u>65 %</u> |
| Atmospheric pressure: | <u>950-1050mbar</u> |

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 | 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 | 2009/11 |
| 2 | Artificial Mains | ROHDE & SCHWARZ | ESH2-Z5 | 100028 | 2009/11 |
| 3 | Pulse Limiter | ROHDE & SCHWARZ | ESHSZ2 | 100044 | 2009/11 |
| 4 | EMI Test Software | ROHDE & SCHWARZ | ESK1 | N/A | 2009/11 |
| 5 | Single Balanced Telecom Pair ISN | FCC | FCC-TLISN-T2-02 | 20371 | 2009/11 |
| 6 | Two Balanced Telecom Pairs ISN | FCC | FCC-TLISN-T4-02 | 20373 | 2009/11 |

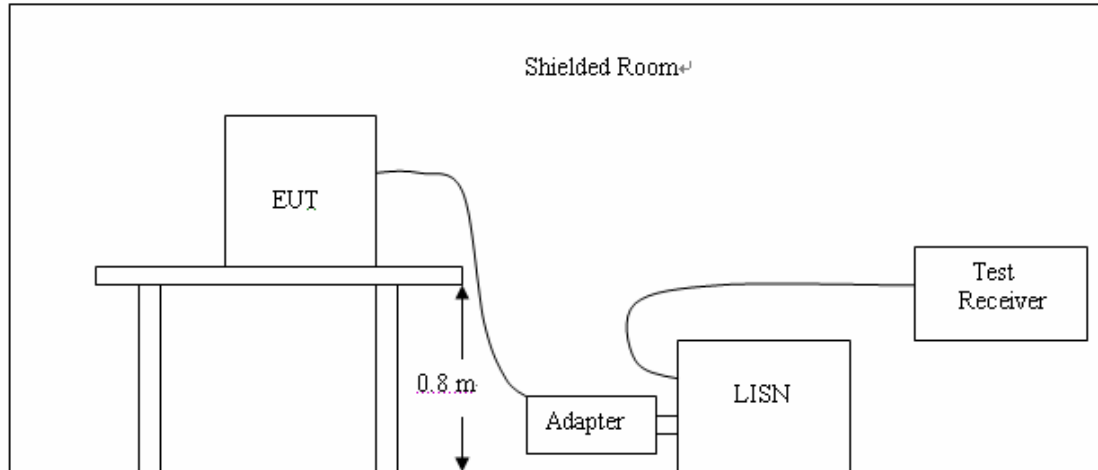
| Radiated Emissions | | | | | |
|--------------------|-------------------------|-----------------|-----------|--------------|-----------|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. |
| 1 | ULTRA-BROADBAND ANTENNA | ROHDE & SCHWARZ | HL562 | 100015 | 2009/11 |
| 2 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESI 26 | 100009 | 2009/11 |
| 3 | RF TEST PANEL | ROHDE & SCHWARZ | TS / RSP | 335015/ 0017 | 2009/11 |
| 4 | TURNTABLE | ETS | 2088 | 2149 | 2009/11 |
| 5 | ANTENNA MAST | ETS | 2075 | 2346 | 2009/11 |
| 6 | EMI TEST SOFTWARE | ROHDE & SCHWARZ | ESK1 | N/A | 2009/11 |
| 7 | HORN ANTENNA | ROHDE & SCHWARZ | HF906 | N/A | 2009/06 |

| 20dB Bandwidth & Deactivation Time & Duty Cycle | | | | | |
|---|-------------------|-----------------|-----------|------------|-----------|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. |
| 1 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESCI | 100106 | 2009/11 |
| 2 | RECEIVER ANTENNA | / | / | / | / |

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 tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 The EUT received DC 5V from PC input 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 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.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

CONDUCTED LIMIT

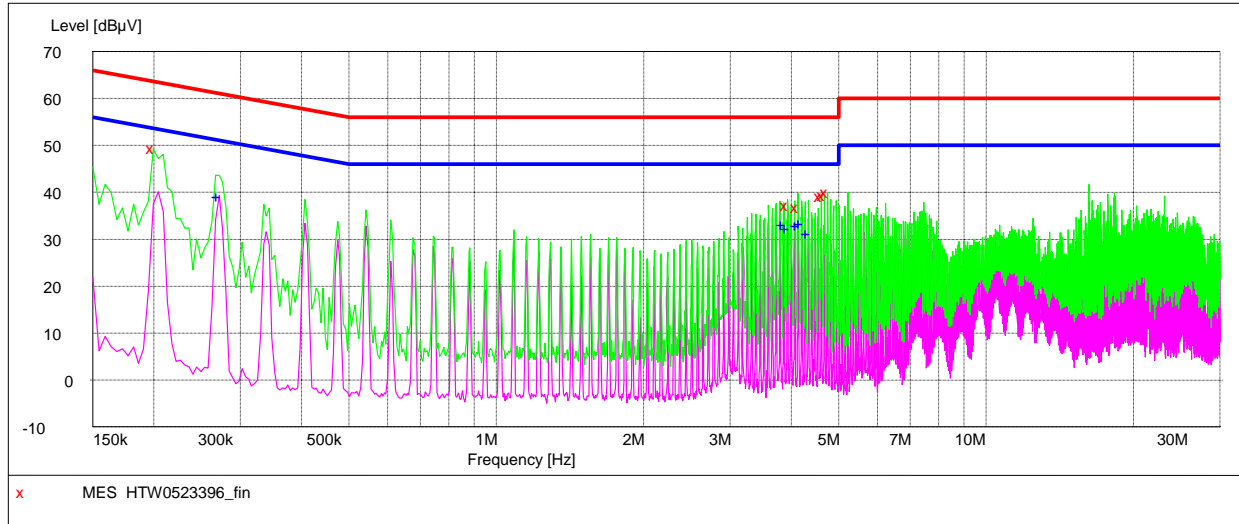
According to FCC Subpart 15 B § 15.207 AC Conducted Emission Limits is as following :

| Frequency fange (MHz) | Conducted limit (dBμV) | |
|---|---------------------------|-----------|
| | 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**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description:

150K-30M Voltage

**MEASUREMENT RESULT: "HTW0523396_fin"**

5/23/2010 8:32PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.199500 | 49.70 | 10.1 | 64 | 13.9 | QP | L1 | GND |
| 3.930000 | 37.40 | 10.2 | 56 | 18.6 | QP | L1 | GND |
| 4.132500 | 37.00 | 10.2 | 56 | 19.0 | QP | L1 | GND |
| 4.609500 | 39.30 | 10.2 | 56 | 16.7 | QP | L1 | GND |
| 4.677000 | 39.70 | 10.2 | 56 | 16.3 | QP | L1 | GND |
| 4.744500 | 40.20 | 10.2 | 56 | 15.8 | QP | L1 | GND |

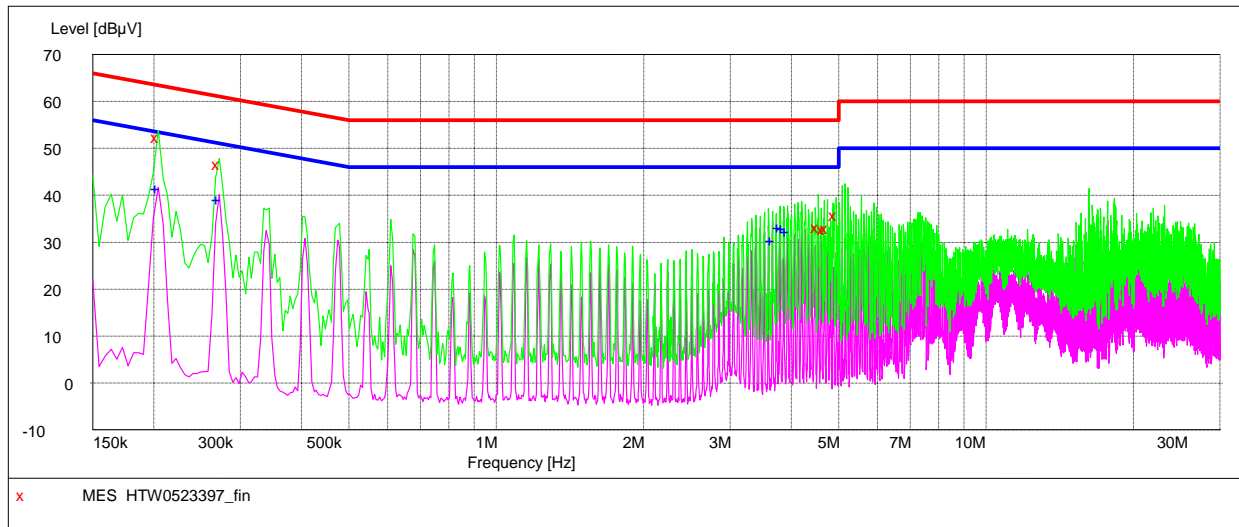
MEASUREMENT RESULT: "HTW0523396_fin2"

5/23/2010 8:32PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.271500 | 39.30 | 10.1 | 51 | 11.8 | AV | L1 | GND |
| 3.862500 | 33.30 | 10.2 | 46 | 12.7 | AV | L1 | GND |
| 3.930000 | 32.60 | 10.2 | 46 | 13.4 | AV | L1 | GND |
| 4.132500 | 33.20 | 10.2 | 46 | 12.8 | AV | L1 | GND |
| 4.204500 | 33.70 | 10.2 | 46 | 12.3 | AV | L1 | GND |
| 4.335000 | 31.60 | 10.2 | 46 | 14.4 | AV | L1 | GND |

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0523397_fin"**

5/23/2010 8:34PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.204000 | 52.60 | 10.1 | 63 | 10.8 | QP | N | GND |
| 0.271500 | 46.80 | 10.1 | 61 | 14.3 | QP | N | GND |
| 4.546500 | 33.40 | 10.2 | 56 | 22.6 | QP | N | GND |
| 4.672500 | 32.90 | 10.2 | 56 | 23.1 | QP | N | GND |
| 4.740000 | 33.20 | 10.2 | 56 | 22.8 | QP | N | GND |
| 4.947000 | 36.00 | 10.2 | 56 | 20.0 | QP | N | GND |

MEASUREMENT RESULT: "HTW0523397_fin2"

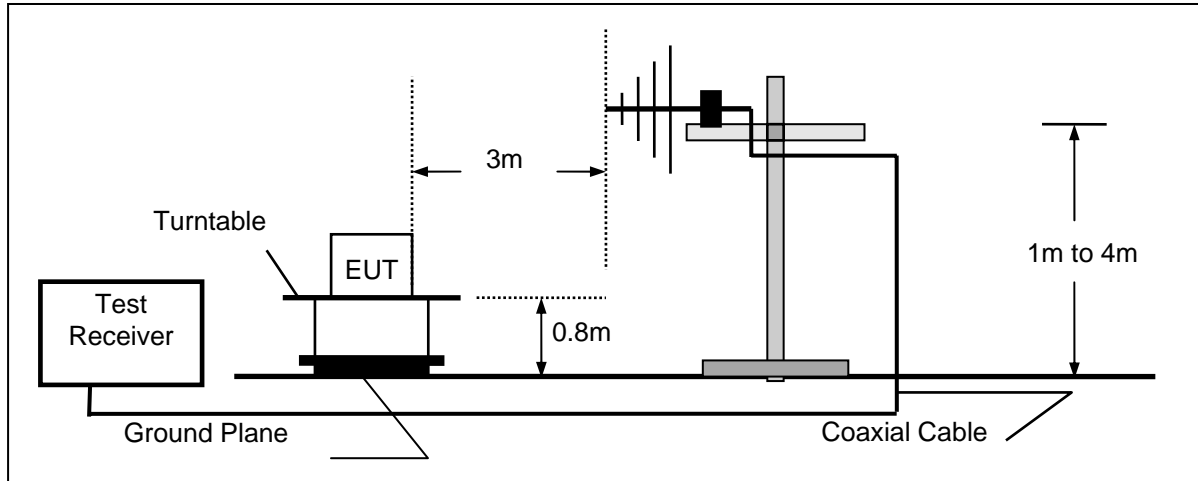
5/23/2010 8:34PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.204000 | 41.70 | 10.1 | 53 | 11.7 | AV | N | GND |
| 0.271500 | 39.50 | 10.1 | 51 | 11.6 | AV | N | GND |
| 3.660000 | 30.60 | 10.2 | 46 | 15.4 | AV | N | GND |
| 3.795000 | 33.50 | 10.2 | 46 | 12.5 | AV | N | GND |
| 3.862500 | 33.10 | 10.2 | 46 | 12.9 | AV | N | GND |
| 3.930000 | 32.50 | 10.2 | 46 | 13.5 | AV | N | GND |

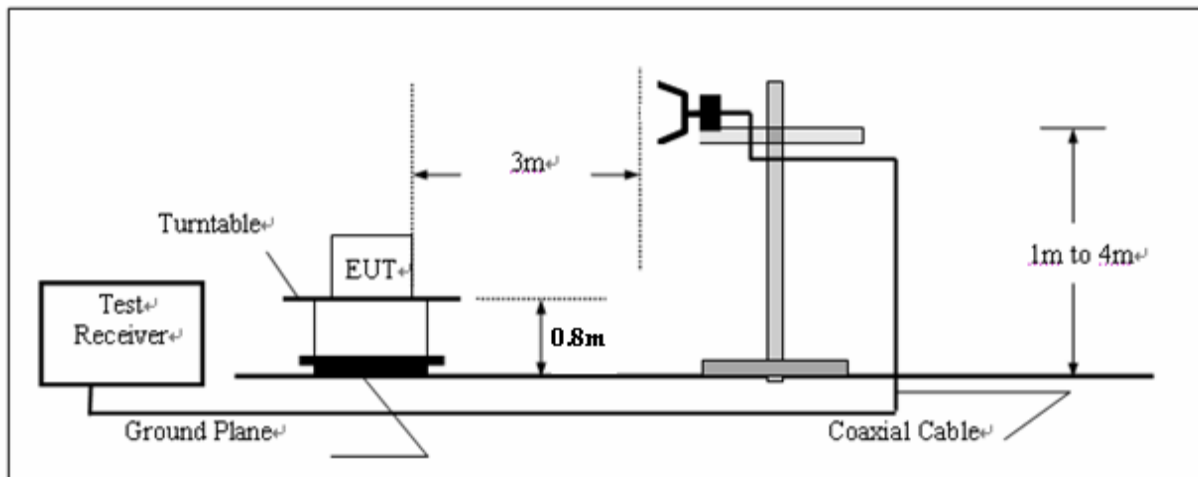
4.2. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up, Frequency range 30 - 1000MHz



Radiated Emission Test Set-Up, Frequency range 1GHz – 6GHz



TEST PROCEDURE

- 1, The EUT was placed on a turn table which is 0.8m above ground plane.
- 2, Connect the EUT to Notebook PC, and EUT will transmit automatic at 433.05MHz.
- 3, 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.
- 4, And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 5, Repeat above procedures until all frequency measurements have been completed.

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 (dBμV/m) | |
|--|-------------------|--|-------|
| | | AV | Peak |
| 433.05 | 3 | 72.84 | 92.84 |
| Note: For the band 260-470MHz, $\mu\text{V/m}$ at 3 meters = $16.6667(F) - 2833.333$ Where F is fundamental frequency 433.05MHz | | | |

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 | |
|---|-------------------|-------------------------------------|------------|
| | | (μV/m) | (dBμV/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 74dBμV/m. | | | |

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

| Frequency (MHz) | Distance (Meters) | Radiated (μV/m) | Radiated (dBμV/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 1GHz to 6GHz are peak measured peak and average level, below 1GHz measured QLevel, detailed test data please see the following pages.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

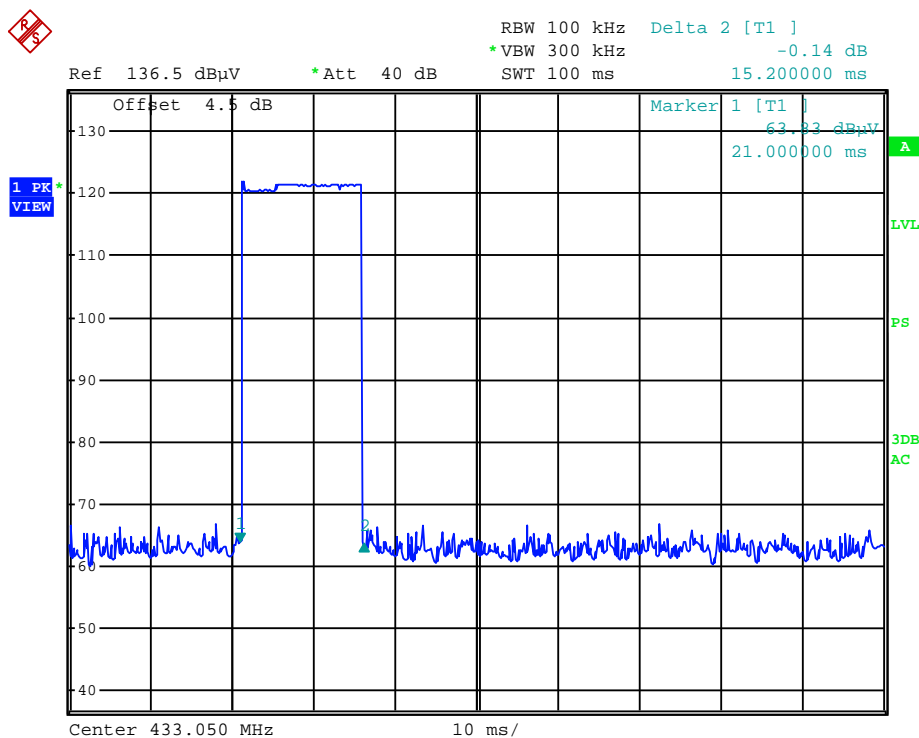
| | |
|---------------------------|--|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude | AG = Amplifier Gain |
| AF = Antenna Factor | |

Duty Cycle Correction Factor

Duty Cycle = TX on/100ms X 100% = 15.2 ms/100ms X 100% = 15.2%

Duty Cycle Correction Factor = $20\log(\text{Duty Cycle}) = -16.4$

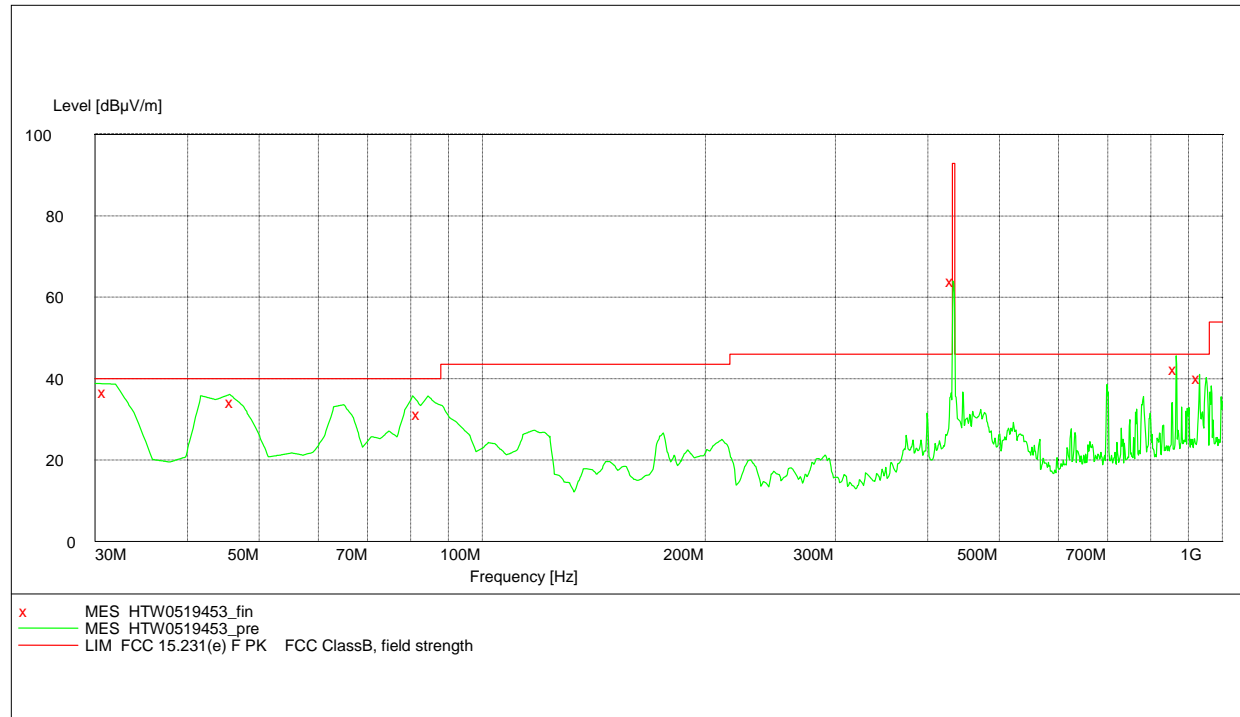
The pulses of 100ms = 1 times



Time of a pulse = 15.2ms

30MHz to 1GHz Test Data**SCAN TABLE: "test Field(30M-1G)QP"**

| | | | | | | |
|--------------------|-----------|----------|------------------------|-------|---------|------------|
| Short Description: | | | Field Strength(30M-1G) | | | |
| Start | Stop | Step | Detector | Meas. | IF | Transducer |
| Frequency | Frequency | Width | | Time | Bandw. | |
| 30.0 MHz | 1.0 GHz | 60.0 kHz | QuasiPeak | 1.0 s | 120 kHz | HL562 09 |

**MEASUREMENT RESULT: "HTW0519453_fin"**

5/19/2010 6:47PM

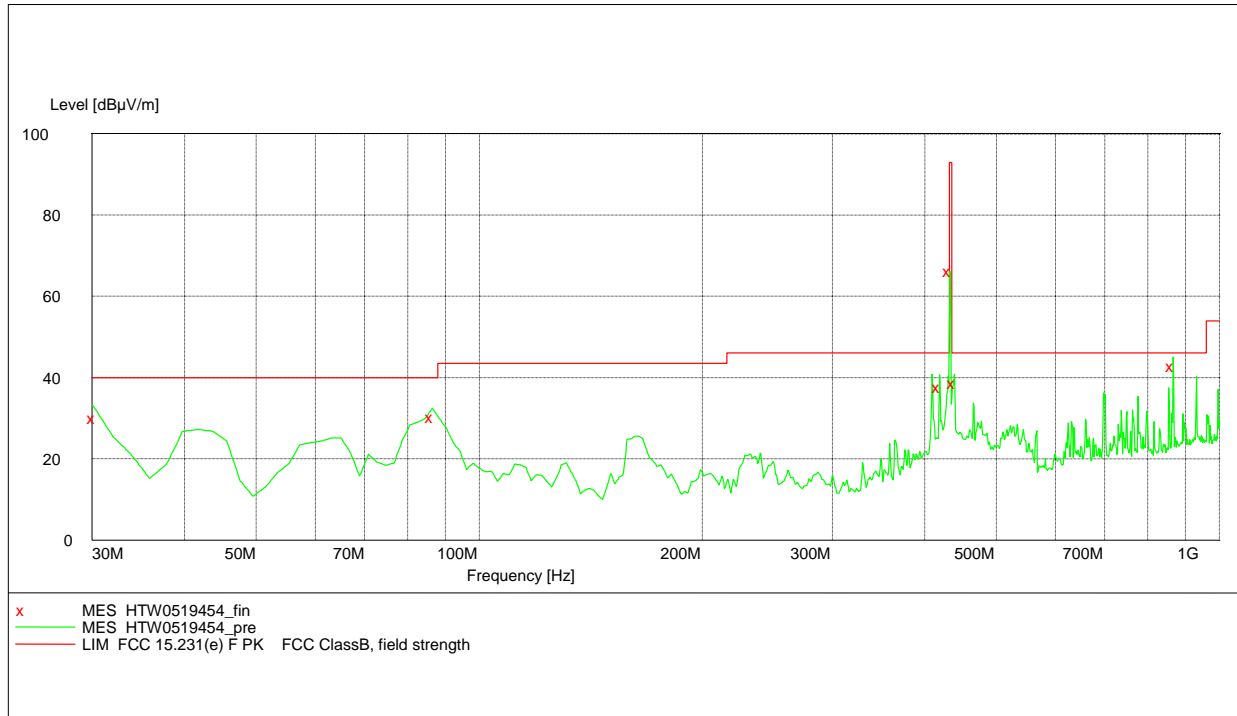
| Frequency MHz | Level dBμV/m | Transd dB | Limit dBμV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 31.020000 | 36.80 | -11.3 | 40.0 | 3.2 | QP | 100.0 | 173.00 | VERTICAL |
| 45.970000 | 34.40 | -17.2 | 40.0 | 5.6 | QP | 100.0 | 339.00 | VERTICAL |
| 84.420000 | 32.30 | -20.8 | 40.0 | 7.7 | QP | 114.0 | 218.00 | VERTICAL |
| 433.050000 | 64.00 | -8.2 | 92.8 | 28.8 | QP | 100.0 | 95.00 | VERTICAL |
| 866.650000 | 42.40 | -5.9 | 46.0 | 3.6 | QP | 123.0 | 105.00 | VERTICAL |
| 931.960000 | 40.10 | -3.4 | 46.0 | 5.9 | QP | 100.0 | 237.00 | VERTICAL |

| Frequency (MHz) | Field strength (dBμV/m) | Limit (dBμV/m) | Duty Cycle Correction Factor | Result (dB) | Margin (dB) | Det. |
|-----------------|-------------------------|----------------|------------------------------|-------------|-------------|------|
| 433.92 | 64.0 | 92.84 | / | 64.0 | 28.84 | Peak |
| | 64.0 | 72.84 | -16.4 | 47.6 | 25.24 | AV |

Note: Result = Field Strength + Duty Cycle Corrcetion Factor

SCAN TABLE: "test Field(30M-1G)QP"

Short Description: Field Strength(30M-1G)
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 30.0 MHz 1.0 GHz 60.0 kHz QuasiPeak 1.0 s 120 kHz HL562 09

**MEASUREMENT RESULT: "HTW0519454_fin"**

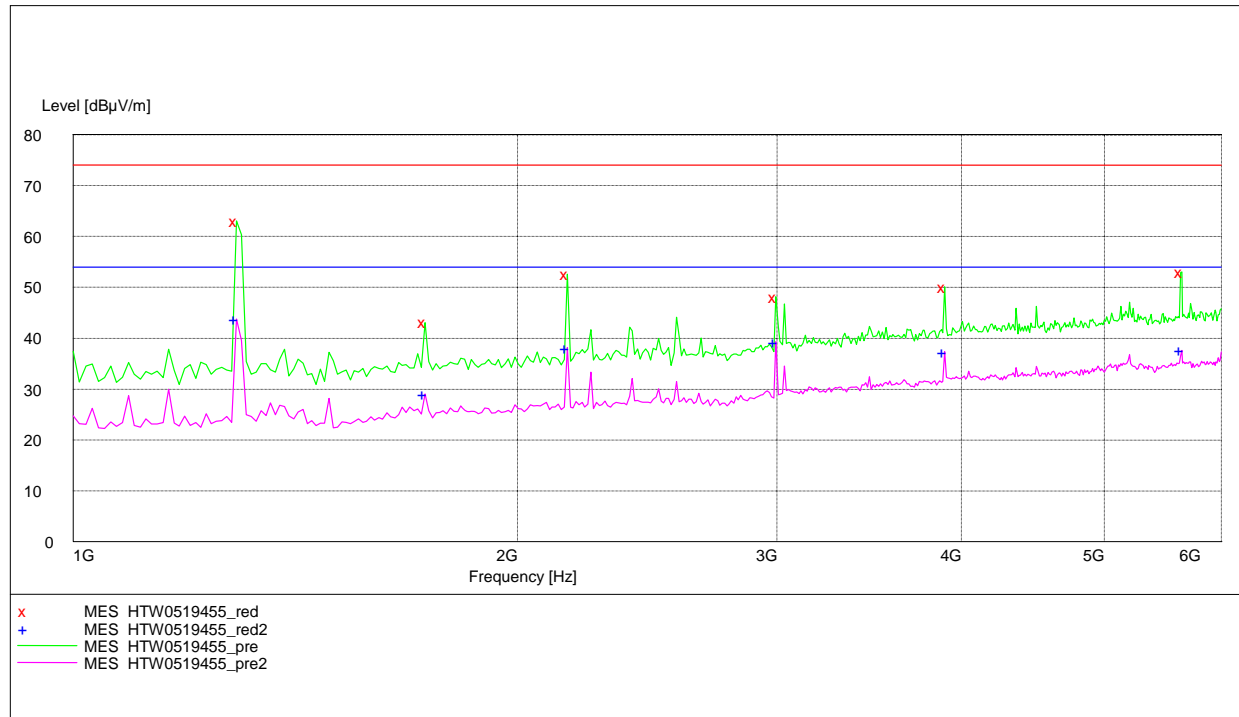
5/19/2010 6:59PM

| Frequency MHz | Level dBμV/m | Transd dB | Limit dBμV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 30.220000 | 30.10 | -12.1 | 40.0 | 9.9 | QP | 100.0 | 96.00 | HORIZONTAL |
| 86.370000 | 30.40 | -20.8 | 40.0 | 9.6 | QP | 104.0 | 130.00 | HORIZONTAL |
| 418.780000 | 37.60 | -14.6 | 46.0 | 8.4 | QP | 144.0 | 171.00 | HORIZONTAL |
| 433.050000 | 66.10 | -8.2 | 92.8 | 26.7 | QP | 104.0 | 137.00 | HORIZONTAL |
| 438.210000 | 38.80 | -14.6 | 46.0 | 7.2 | QP | 114.0 | 149.00 | HORIZONTAL |
| 865.630000 | 42.80 | -6.0 | 46.0 | 3.2 | QP | 147.0 | 205.00 | HORIZONTAL |

| Frequency (MHz) | Field strength (dBμV/m) | Limit (dBμV/m) | Duty Cycle Correction Factor | Result (dB) | Margin (dB) | Det. |
|--|-------------------------------|-------------------|------------------------------------|----------------|----------------|------|
| 433.05 | 66.1 | 92.84 | / | 66.1 | 26.74 | Peak |
| | 66.1 | 72.84 | -16.4 | 49.7 | 23.14 | AV |
| Note: Result = Field Strength + Duty Cycle Corrcetion Factor | | | | | | |

1GHz to 5GHz Test Data***SWEEP TABLE: "test (1G-18G) P"***

| | | | | | |
|--------------------|-----------|-------------------------|---------|--------|-------------|
| Short Description: | | EN 55022 Field Strength | | | |
| Start | Stop | Detector | Meas. | IF | Transducer |
| Frequency | Frequency | | Time | Bandw. | |
| 1.0 GHz | 18.0 GHz | MaxPeak | Coupled | 1 MHz | HF906(2009) |
| | | Average | | | |

***MEASUREMENT RESULT: "HTW0519455_red"***

5/19/2010 6:17PM

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1290.581162 | 63.10 | -7.7 | 74.0 | 10.9 | Peak | 100.0 | 269.00 | HORIZONTAL |
| 1731.462926 | 43.10 | -6.3 | 74.0 | 30.9 | Peak | 100.0 | 79.00 | HORIZONTAL |
| 2162.324649 | 52.60 | -4.5 | 74.0 | 21.4 | Peak | 100.0 | 59.00 | HORIZONTAL |
| 2993.987976 | 48.20 | -1.7 | 74.0 | 25.8 | Peak | 100.0 | 322.00 | HORIZONTAL |
| 3895.791583 | 50.10 | 1.4 | 74.0 | 23.9 | Peak | 100.0 | 228.00 | HORIZONTAL |
| 5639.278557 | 53.10 | 5.0 | 74.0 | 20.9 | Peak | 100.0 | 119.00 | HORIZONTAL |

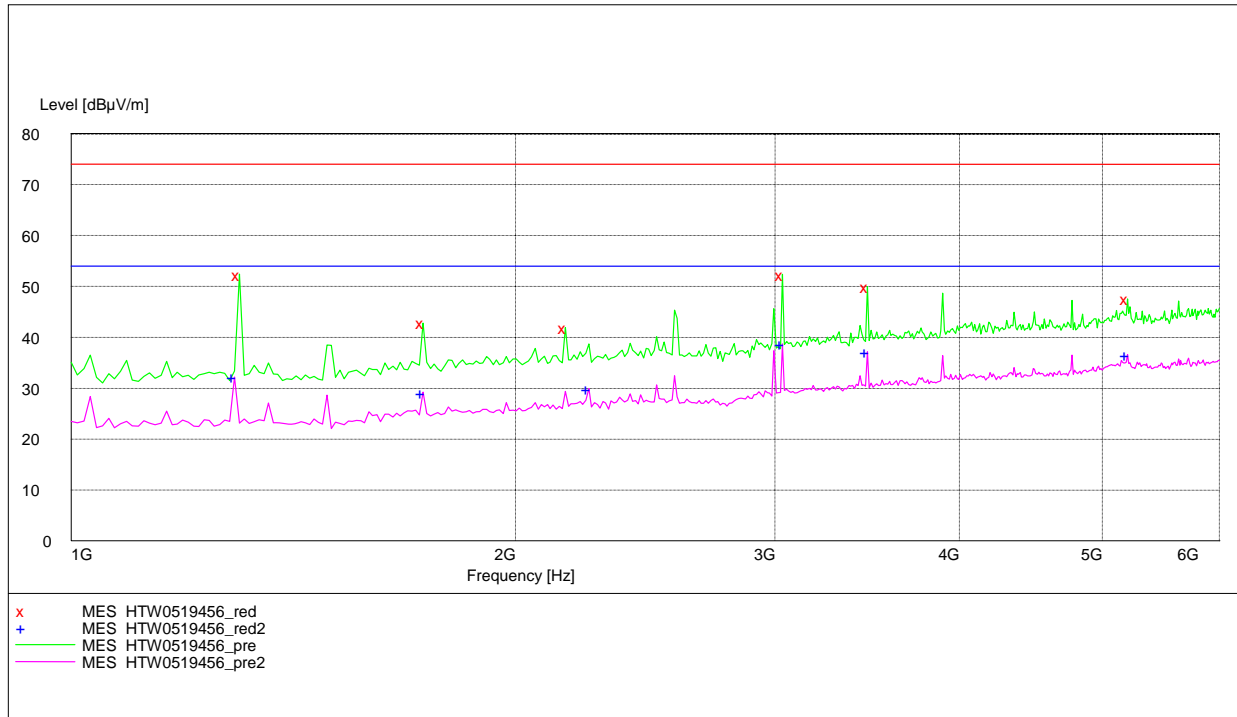
MEASUREMENT RESULT: "HTW0519455_red2"

5/19/2010 6:17PM

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1290.581162 | 43.80 | -7.7 | 54.0 | 10.2 | AV | 100.0 | 269.00 | HORIZONTAL |
| 1731.462926 | 29.00 | -6.3 | 54.0 | 25.0 | AV | 100.0 | 79.00 | HORIZONTAL |
| 2162.324649 | 38.10 | -4.5 | 54.0 | 15.9 | AV | 100.0 | 59.00 | HORIZONTAL |
| 2993.987976 | 39.30 | -1.7 | 54.0 | 14.7 | AV | 100.0 | 359.00 | HORIZONTAL |
| 3895.791583 | 37.30 | 1.4 | 54.0 | 16.7 | AV | 100.0 | 228.00 | HORIZONTAL |
| 5639.278557 | 37.60 | 5.0 | 54.0 | 16.4 | AV | 100.0 | 119.00 | HORIZONTAL |

SWEEP TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.0 GHz 18.0 GHz MaxPeak Coupled 1 MHz HF906(2009)
Average

***MEASUREMENT RESULT: "HTW0519456_red"***

5/19/2010 6:20PM

| Frequency MHz | Level dBμV/m | Transd dB | Limit dBμV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1300.601202 | 52.40 | -7.6 | 74.0 | 21.6 | Peak | 100.0 | 66.00 | VERTICAL |
| 1731.462926 | 42.80 | -6.3 | 74.0 | 31.2 | Peak | 100.0 | 66.00 | VERTICAL |
| 2162.324649 | 41.90 | -4.5 | 74.0 | 32.1 | Peak | 100.0 | 66.00 | VERTICAL |
| 3034.068136 | 52.40 | -1.6 | 74.0 | 21.6 | Peak | 100.0 | 100.00 | VERTICAL |
| 3464.929860 | 49.90 | -0.2 | 74.0 | 24.1 | Peak | 100.0 | 234.00 | VERTICAL |
| 5198.396794 | 47.60 | 4.6 | 74.0 | 26.4 | Peak | 100.0 | 133.00 | VERTICAL |

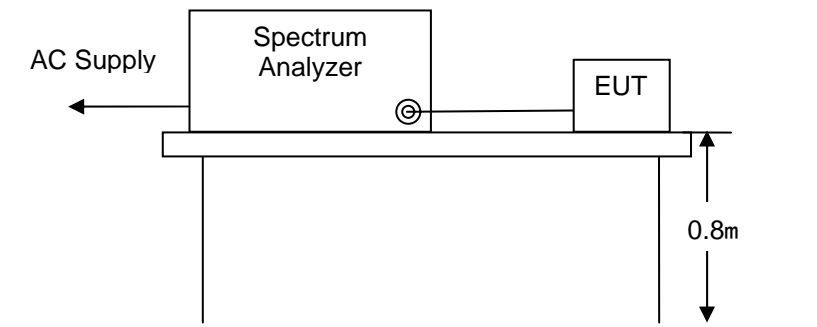
MEASUREMENT RESULT: "HTW0519456_red2"

5/19/2010 6:20PM

| Frequency MHz | Level dBμV/m | Transd dB | Limit dBμV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1290.581162 | 32.20 | -7.7 | 54.0 | 21.8 | AV | 100.0 | 66.00 | VERTICAL |
| 1731.462926 | 29.20 | -6.3 | 54.0 | 24.8 | AV | 100.0 | 66.00 | VERTICAL |
| 2242.484970 | 29.90 | -4.2 | 54.0 | 24.1 | AV | 100.0 | 321.00 | VERTICAL |
| 3034.068136 | 38.70 | -1.6 | 54.0 | 15.3 | AV | 100.0 | 100.00 | VERTICAL |
| 3464.929860 | 37.20 | -0.2 | 54.0 | 16.8 | AV | 100.0 | 234.00 | VERTICAL |
| 5198.396794 | 36.60 | 4.6 | 54.0 | 17.4 | AV | 100.0 | 133.00 | VERTICAL |

4.3. Deactivation Time

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 100 kHz and video bandwidth was set to 300 kHz 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)

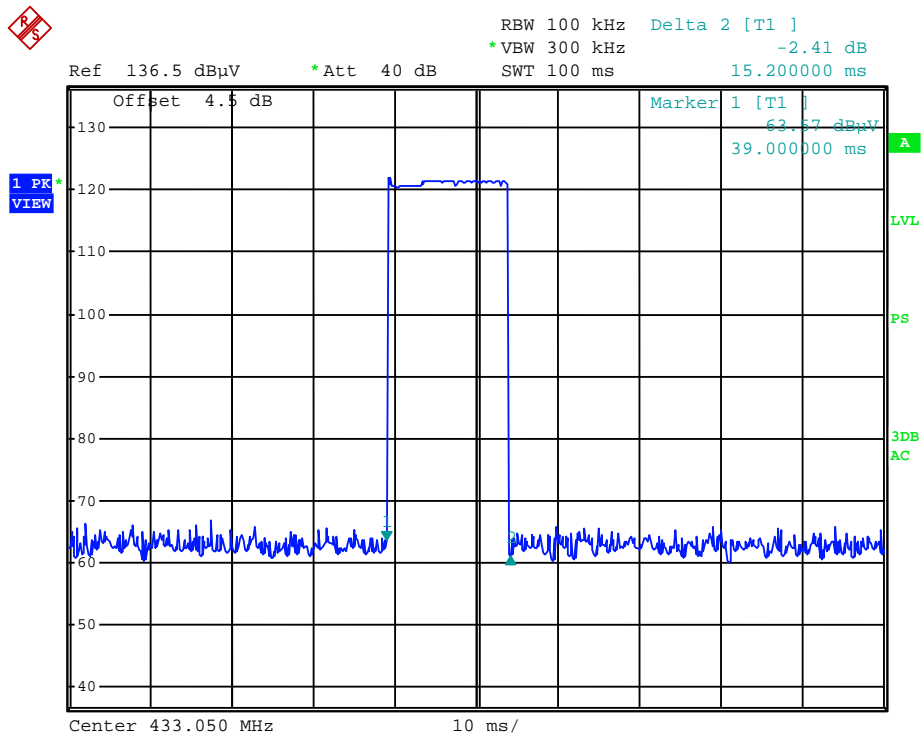
| Item | Limit (second) |
|-----------------------|--|
| One transmission time | not greater than 1 second |
| Transmission period | at least 30 times the duration of the transmsion but in no case less than 10 second |

TEST RESULTS

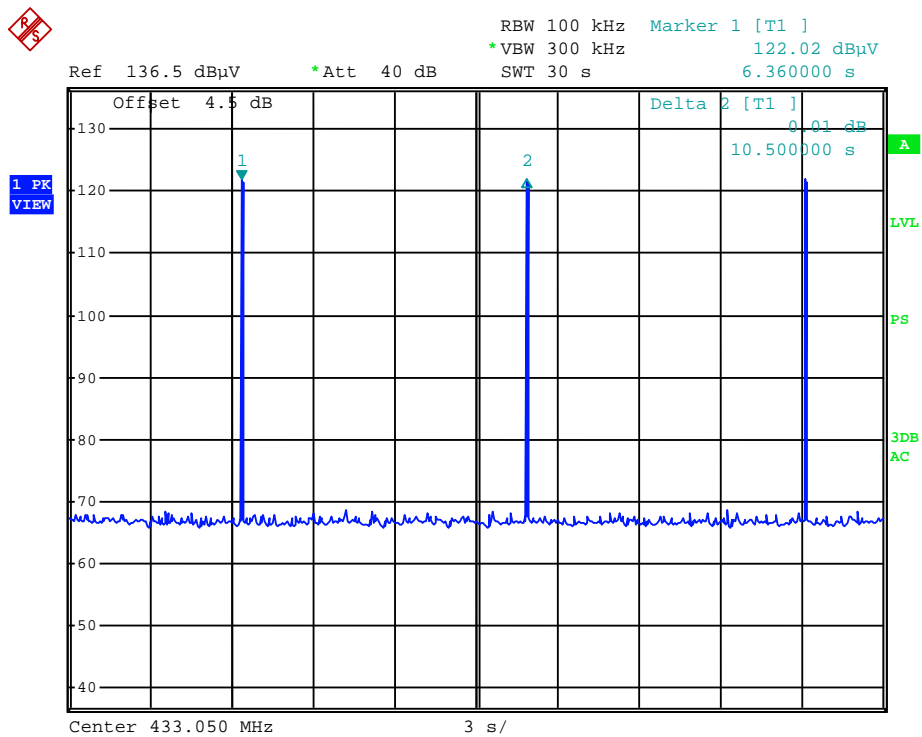
EUT statement: The transmitter was automatically activated, and the carrier frequency 433.05MHz:

| Frequency (MHz) | One transmission time (second) | Transmission period (second) | Result |
|--------------------|-----------------------------------|---------------------------------|--------|
| 433.05 | 0.0152 | 10.50 | Pass |

The time of one transmission



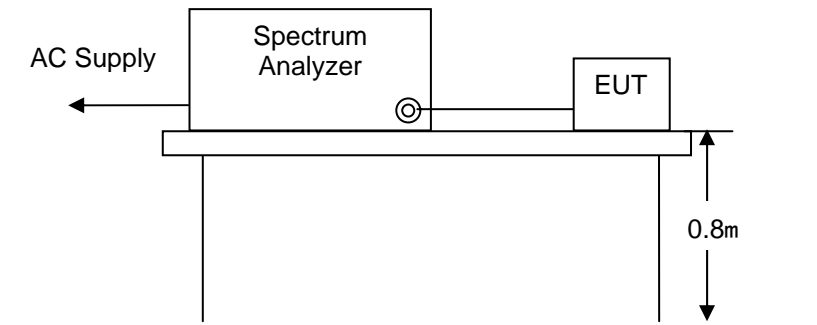
The time of transmission period



Date: 19.MAY.2010 18:34:59

4.4. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 100 kHz and video bandwidth was set to 300 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

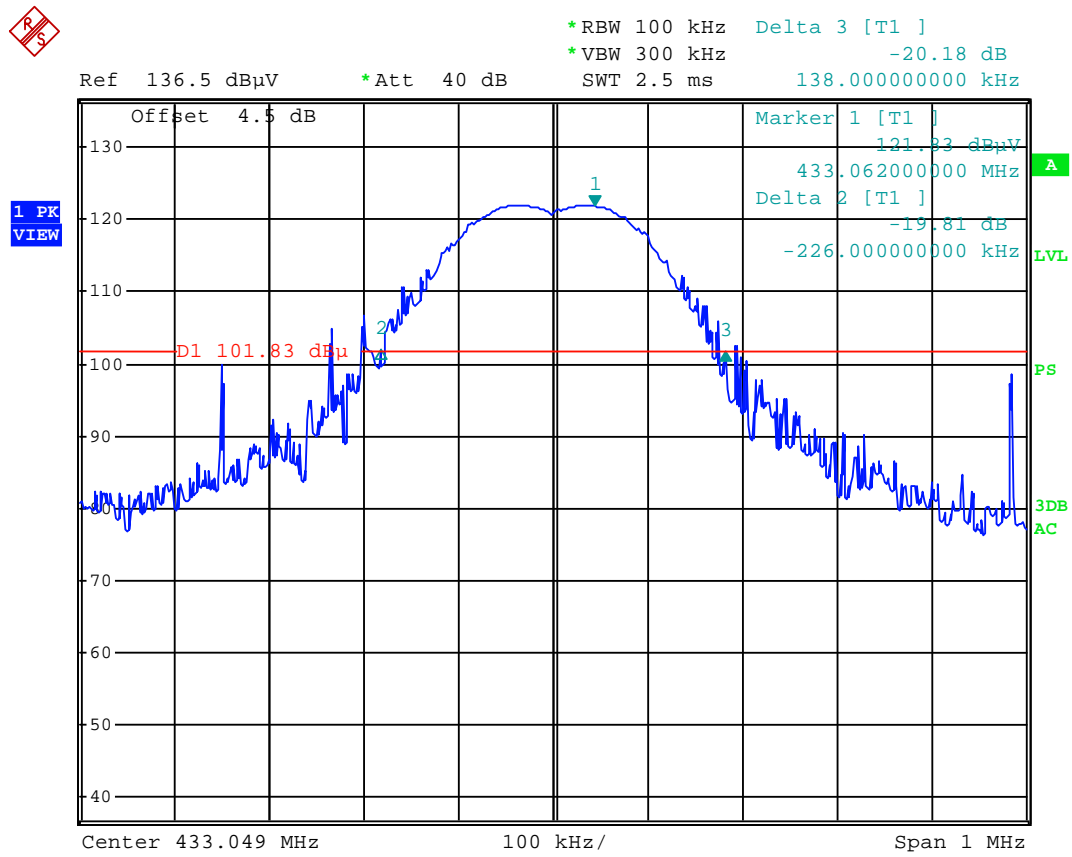
According to FCC Part 15C § 15.231(c)

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 |
|-----------------|--|-------------|--------|
| 433.05 | 364 | 1082.63 | Pass |

20dB Bandwidth

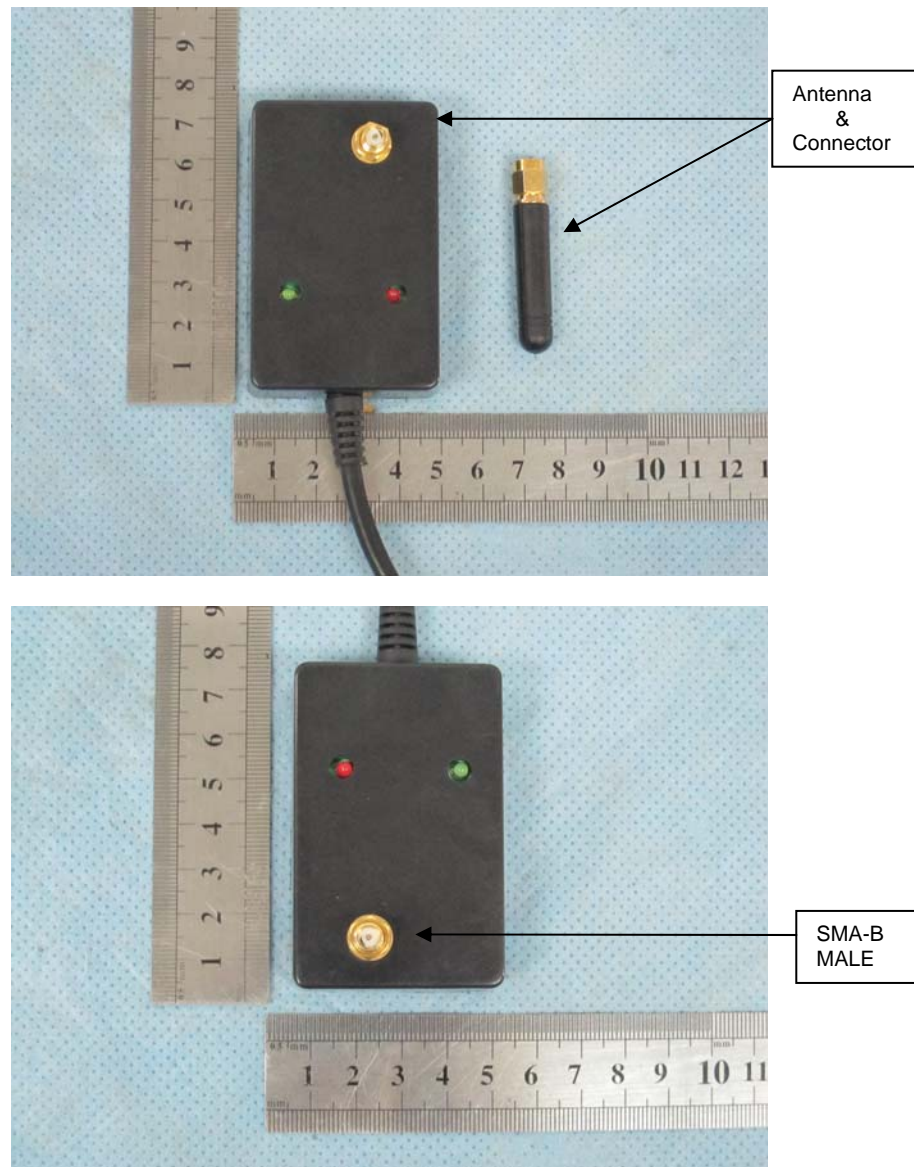


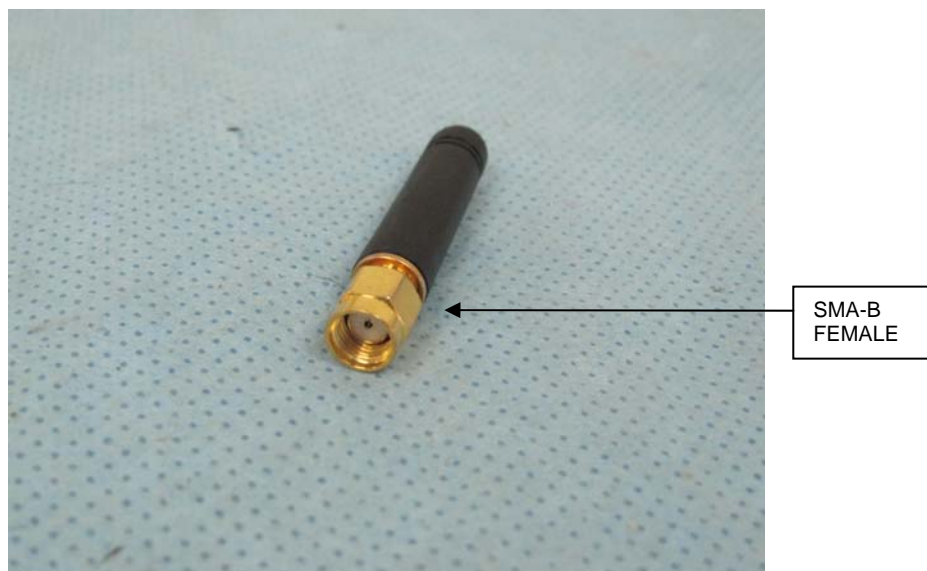
4.5. Antenna Requirement

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 nonstandard antenna connector (SMA-B), so the EUT meets the requirements of antenna. Detial please see the photos as following:



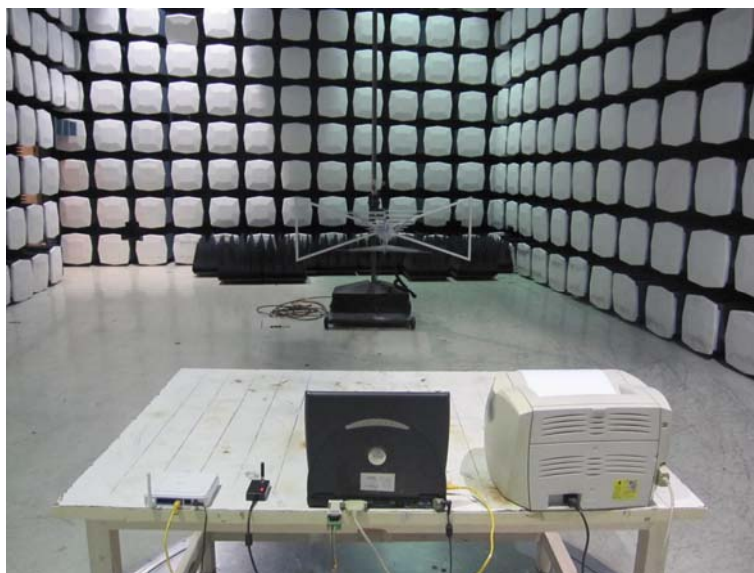
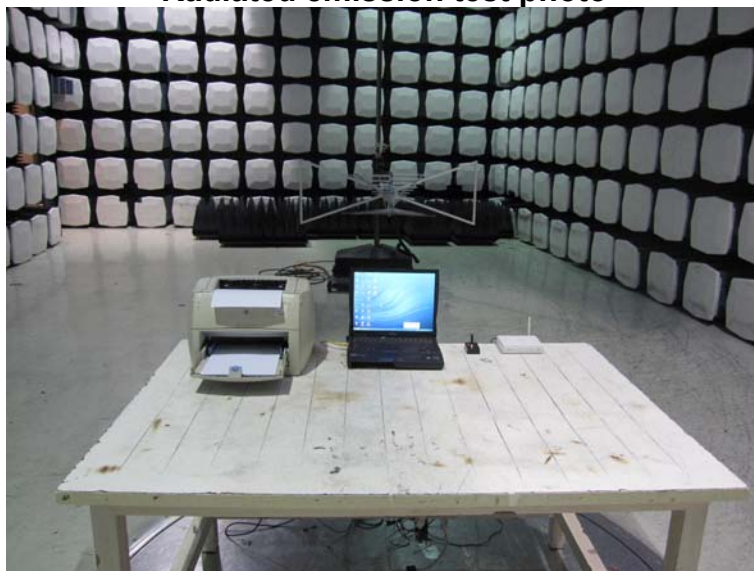


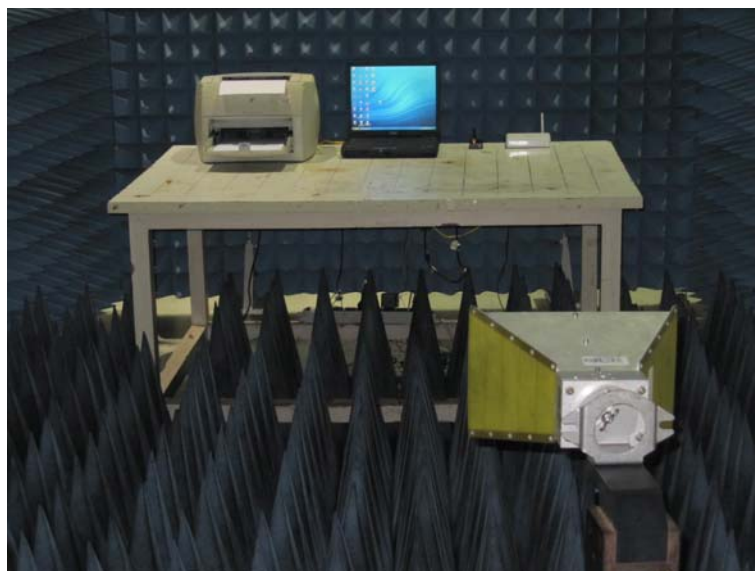
5. Test Setup Photos of the EUT

AC conducted emission test photo



Radiated emission test photo

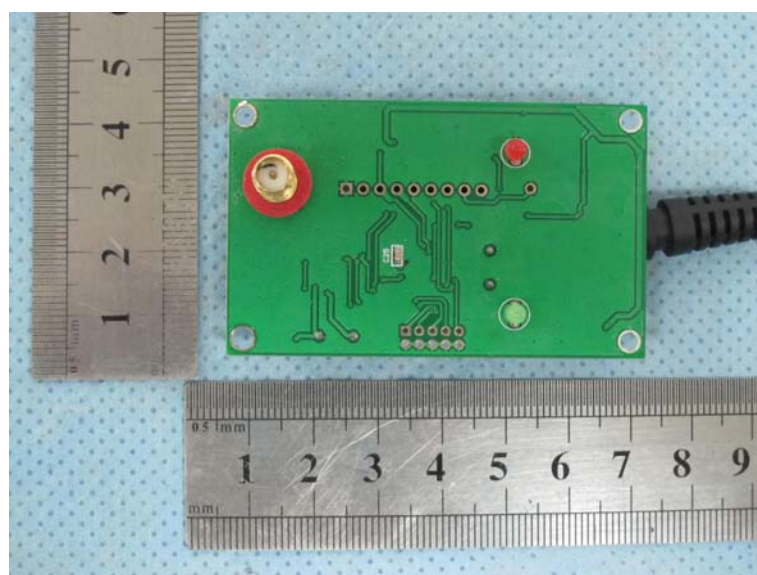


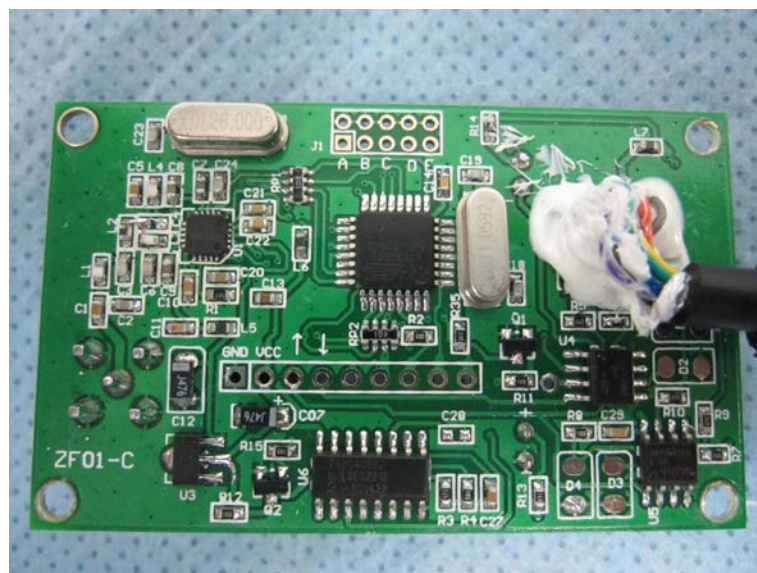
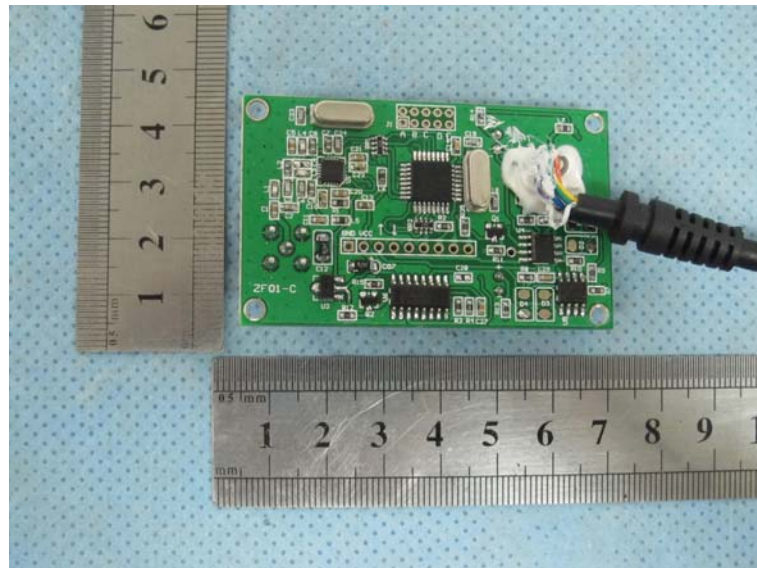


6. External and Internal Photos of the EUT

External Photos



Internal Photos



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