

EMC TEST REPORT
for
Beijing Inhand Networks Technology Co., Ltd.

Industrial cellular modem

Model No.: InDTU320W, InDTU321W, InDTU322W InDTU332W, InDTU330W,
InDTU331W, InDTU333W, InDTU334W, InDTU335W, InDTU336W, InDTU337W,
InDTU338W, InDTU339W, InDTU310W, InDTU311W, InDTU312W, InDTU313W,
InDTU314W, InDTU315W, InDTU316W, InDTU317W, InDTU318W, InDTU319W,
InDTU323W, InDTU324W, InDTU325W, InDTU326W, InDTU327W, InDTU328W,
InDTU329W.

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Report Number : R011505295E
Date of Test : May 13~17, 2015
Date of Report : May 18, 2015

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APPENDIX I (Photos of the EUT) (3 pages)

TEST REPORT VERIFICATION

Applicant : Beijing Inhand Networks Technology Co., Ltd.
Manufacturer : Beijing Inhand Networks Technology Co., Ltd.
EUT : Industrial cellular modem
Model No. : InDTU320W, InDTU321W, InDTU322W InDTU332W, InDTU330W, InDTU331W, InDTU333W, InDTU334W, InDTU335W, InDTU336W, InDTU337W, InDTU338W, InDTU339W, InDTU310W, InDTU311W, InDTU312W, InDTU313W, InDTU314W, InDTU315W, InDTU316W, InDTU317W, InDTU318W, InDTU319W, InDTU323W, InDTU324W, InDTU325W, InDTU326W, InDTU327W, InDTU328W, InDTU329W.
Rating : 5-35V \equiv 0.1-0.02A
Trade Mark : InHand

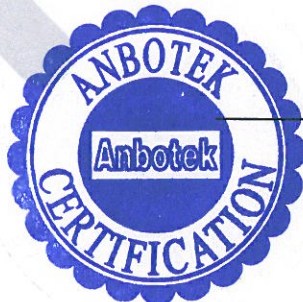
Measurement Procedure Used:
EN 55022: 2010+AC: 2011;
EN 55024: 2010;
(IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4;
IEC 61000-4-5; IEC 61000-4-6)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 55022, EN 55024 requirements. The Project in IEC 61000-4-3 was tested in Shenzhen EMTEK Co., Ltd.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : May 13~17, 2015

Prepared by :



Kebo Zhang
(Engineer/ Kebo Zhang)

Reviewer :

Angel Deng
(Project Manager/ Angel Deng)

Approved & Authorized Signer :

Tom Chen
(Manager/ Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

| | | |
|----------------------|---|---|
| EUT | : | Industrial cellular modem |
| Model Number | : | InDTU320W, InDTU321W, InDTU322W InDTU332W, InDTU330W, InDTU331W, InDTU333W, InDTU334W, InDTU335W, InDTU336W, InDTU337W, InDTU338W, InDTU339W, InDTU310W, InDTU311W, InDTU312W, InDTU313W, InDTU314W, InDTU315W, InDTU316W, InDTU317W, InDTU318W, InDTU319W, InDTU323W, InDTU324W, InDTU325W, InDTU326W, InDTU327W, InDTU328W, InDTU329W. (Note: All samples are the same except the model number & appearance, so we prepare “InDTU320W” for EMC test only.) |
| Test Power Supply | : | DC 12V |
| Applicant Address | : | Beijing Inhand Networks Technology Co., Ltd. 101, West Wing, 11th Floor, No.101, Lize Central Park, Wangjing, Chaoyang District, Beijing, 100102, P.R. China |
| Manufacturer Address | : | Beijing Inhand Networks Technology Co., Ltd. 101, West Wing, 11th Floor, No.101, Lize Central Park, Wangjing, Chaoyang District, Beijing, 100102, P.R. China |
| Factory Address | : | Beijing Inhand Networks Technology Co., Ltd. 101, West Wing, 11th Floor, No.101, Lize Central Park, Wangjing, Chaoyang District, Beijing, 100102, P.R. China |
| Date of receipt | : | May 12, 2015 |
| Date of Test | : | May 13~17, 2015 |

1.2. Auxiliary Equipment Used during Test

- PC : Manufacturer: DELL
M/N: Optiplex 3020 MT
S/N: CN-079V51-70163-4AD-089K-A00
Input Rating: AC 100-240V, 50-60Hz 5.4A
CE , FCC DOC, CCC
- MONITOR : Manufacturer: DELL
M/N: UZ2215Hf
S/N: CN-035VN6-72872-45A-A3AB
Input Rating: AC 100-240V, 50-60Hz, 1.5A
Output Rating: DC 19.5V, 4.62A
TUV-GS, FCC, CE, KCC, VCCI
- KEYBOARD : Manufacturer: DELL
M/N: SK-8120
S/N: CN-0DJ365-71616-49J-0MVR-A00
Input Rating: DC 5V via USB Port,0.05A
CE, FCC, VCCI, KCC, TUV-GS
Cable: 1.8m, unshielded
- MOUSE : Manufacturer: DELL
M/N: MS111-T
S/N: CN-0KW2YH-71616-488-1CBJ
Input Rating: DC 5V via USB Port,0.1A
Cable: 1.8m, unshielded
CE, FCC, VCCI, KCC, TUV-GS

1.3. Description of Test Facility

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

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Loads Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, Feb. 22, 2013.

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing Laboratories.

Test Location

All Emissions tests were performed
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

| | | |
|------------------------|---|--|
| Radiation Uncertainty | : | Ur = 4.1dB (Horizontal) Ur = 4.3dB (Vertical) |
| Conduction Uncertainty | : | Uc = 3.4dB |

1.5. Test Summary

For the EUT described above. The standards used were EN 55022 for Emissions & EN 55024 for Immunity.

Table 1 : Tests Carried Out Under EN 55022: 2010+AC: 2011

| Standard | Test Items | Status |
|-------------------------|--|--------|
| EN 55022: 2010+AC: 2011 | Power Line Conducted Emission Test (150KHz To 30MHz) | √ |
| EN 55022: 2010+AC: 2011 | Radiated Emission Test (30MHz To 1000MHz) | √ |

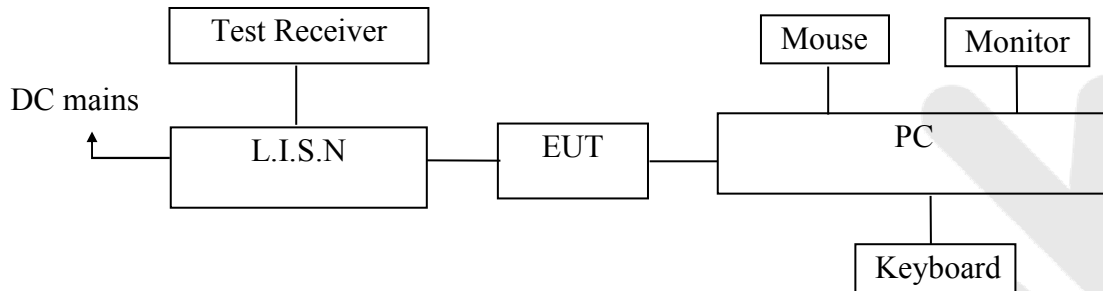
Table 2 : Tests Carried Out Under EN 55024: 2010

| Standard | Test Items | Status |
|----------------|---|--------|
| EN 55024: 2010 | Electrostatic Discharge immunity Test | √ |
| EN 55024: 2010 | RF Field Strength susceptibility Test | √ |
| EN 55024: 2010 | Electrical Fast Transient/Burst Immunity Test | √ |
| EN 55024: 2010 | Surge Immunity Test | √ |
| EN 55024: 2010 | Injected Currents Susceptibility Test | √ |
| EN 55024: 2010 | Magnetic Field Susceptibility Test | x |
| EN 55024: 2010 | Voltage Dips and Interruptions Test | x |

- √ Indicates that the test is applicable
- x Indicates that the test is not applicable

2. POWER LINE CONDUCTED EMISSION TEST

2.1. Block Diagram of Test Setup



2.2. Measuring Standard

EN 55022: 2010+AC: 2011

2.3. Power Line Conducted Emission Limits

| Frequency (MHz) | Limit (dB μ V) | |
|-----------------|--------------------|---------------|
| | Quasi-peak Level | Average Level |
| 0.15 ~ 0.50 | 79 | 66 |
| 0.50 ~ 30.00 | 73 | 60 |

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

2.4. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 55022 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT as shown on Section 2.1.
- 2.5.2. Turn on the power of all equipments.
- 2.5.3. Let the EUT work in measuring mode (On) and measure it.

2.6. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and

connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55022 regulations during conducted emission measurement.

The bandwidth of the test receiver (ESCI) is set at 9KHz in 150KHz~30MHz.

The frequency range from 150KHz to 30MHz is investigated for AC mains.

The test results are listed in Section 2.8.

2.7. Test Equipment

The following test equipments are used during the power line conducted emission measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--------------------|----------------------|-----------|------------|---------------|---------------|
| 1. | Two-Line V-network | Rohde & Schwarz | ENV216 | 100055 | Apr. 17, 2015 | 1 Year |
| 2. | EMI Test Receiver | Rohde & Schwarz | ESCI | 100627 | Apr. 17, 2015 | 1 Year |
| 3. | RF Switching Unit | Compliance Direction | RSU-M2 | 38303 | Apr. 17, 2015 | 1 Year |

2.8. Measuring Results

PASS.

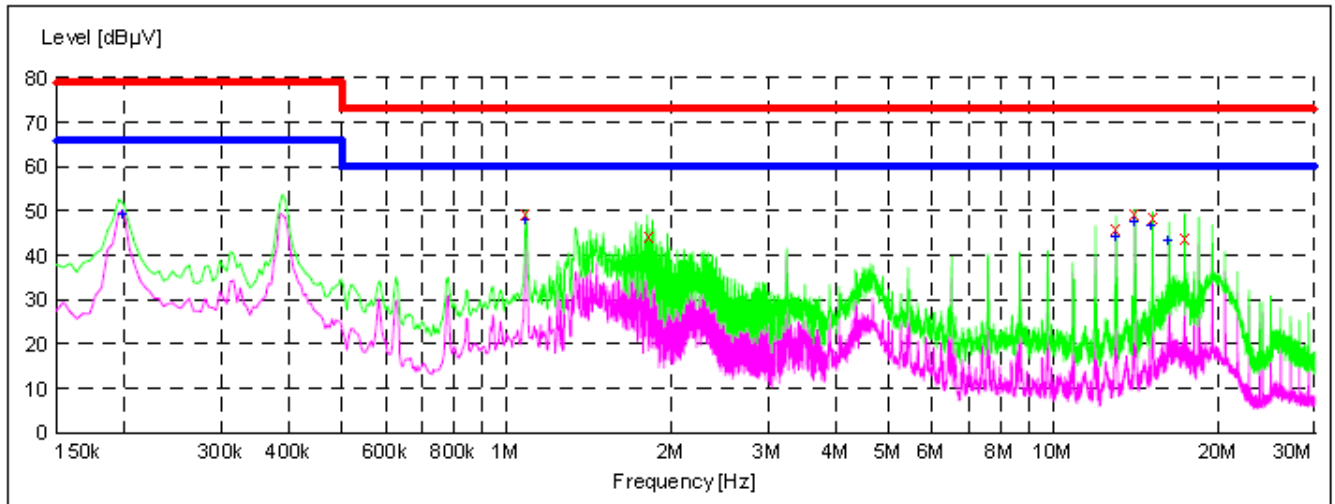
The frequency range 150KHz to 30MHz is investigated

The test curves are shown in the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: DC 12V
 Comment: +
 Tem:22.2°C Hum:60%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages



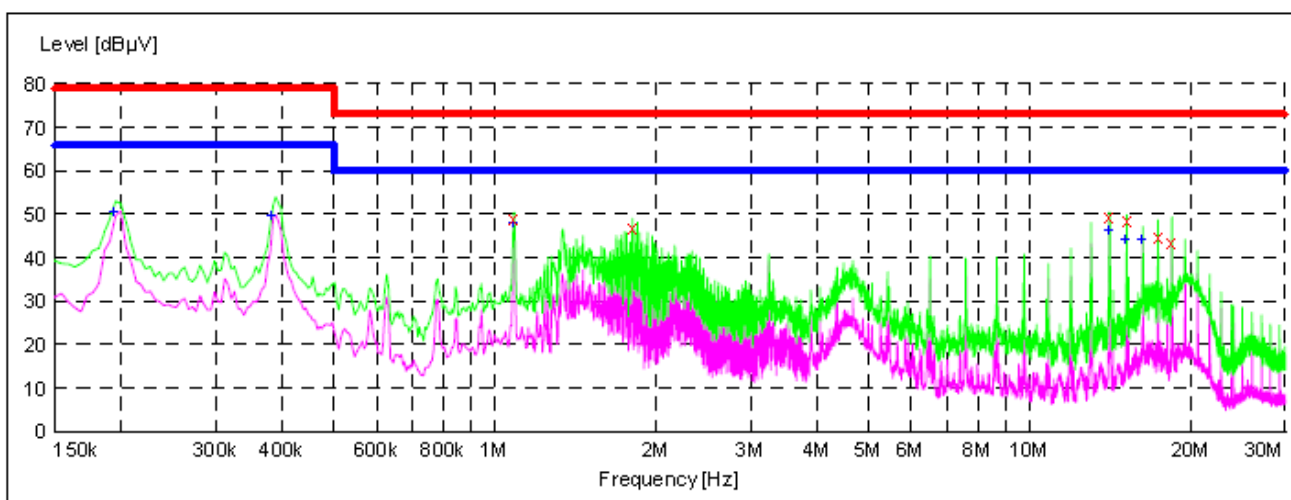
| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 1.085500 | 49.70 | 20.2 | 73 | 23.3 | QP | + | GND |
| 1.823500 | 44.50 | 20.3 | 73 | 28.5 | QP | + | GND |
| 13.006000 | 46.30 | 20.7 | 73 | 26.7 | QP | + | GND |
| 14.086000 | 49.50 | 20.7 | 73 | 23.5 | QP | + | GND |
| 15.170500 | 48.80 | 20.7 | 73 | 24.2 | QP | + | GND |
| 17.335000 | 44.20 | 20.8 | 73 | 28.8 | QP | + | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.199500 | 49.40 | 20.1 | 66 | 16.6 | AV | + | GND |
| 1.085500 | 48.50 | 20.2 | 60 | 11.5 | AV | + | GND |
| 13.001500 | 44.40 | 20.7 | 60 | 15.6 | AV | + | GND |
| 14.086000 | 47.90 | 20.7 | 60 | 12.1 | AV | + | GND |
| 15.170500 | 47.20 | 20.7 | 60 | 12.8 | AV | + | GND |
| 16.255000 | 43.70 | 20.7 | 60 | 16.3 | AV | + | GND |

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: DC 12V
 Comment: -
 Tem:22.2°C Hum:60%

SCAN TABLE: "Voltage(150K~30M)FIN"
 Short Description: 150K-30M Disturbance Voltages



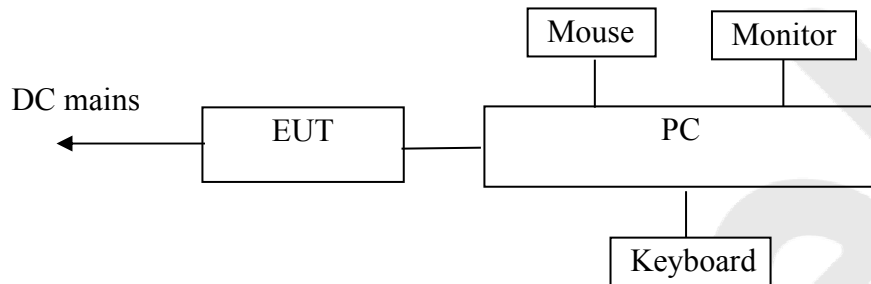
| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 1.085500 | 49.30 | 20.2 | 73 | 23.7 | QP | - | GND |
| 1.805500 | 46.90 | 20.3 | 73 | 26.1 | QP | - | GND |
| 14.086000 | 49.50 | 20.7 | 73 | 23.5 | QP | - | GND |
| 15.166000 | 48.70 | 20.7 | 73 | 24.3 | QP | - | GND |
| 17.339500 | 44.80 | 20.8 | 73 | 28.2 | QP | - | GND |
| 18.424000 | 43.60 | 20.8 | 73 | 29.4 | QP | - | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.195000 | 50.70 | 20.1 | 66 | 15.3 | AV | - | GND |
| 0.384000 | 50.00 | 20.1 | 66 | 16.0 | AV | - | GND |
| 1.085500 | 48.10 | 20.2 | 60 | 11.9 | AV | - | GND |
| 14.086000 | 46.40 | 20.7 | 60 | 13.6 | AV | - | GND |
| 15.170500 | 44.40 | 20.7 | 60 | 15.6 | AV | - | GND |
| 16.250500 | 44.40 | 20.7 | 60 | 15.6 | AV | - | GND |

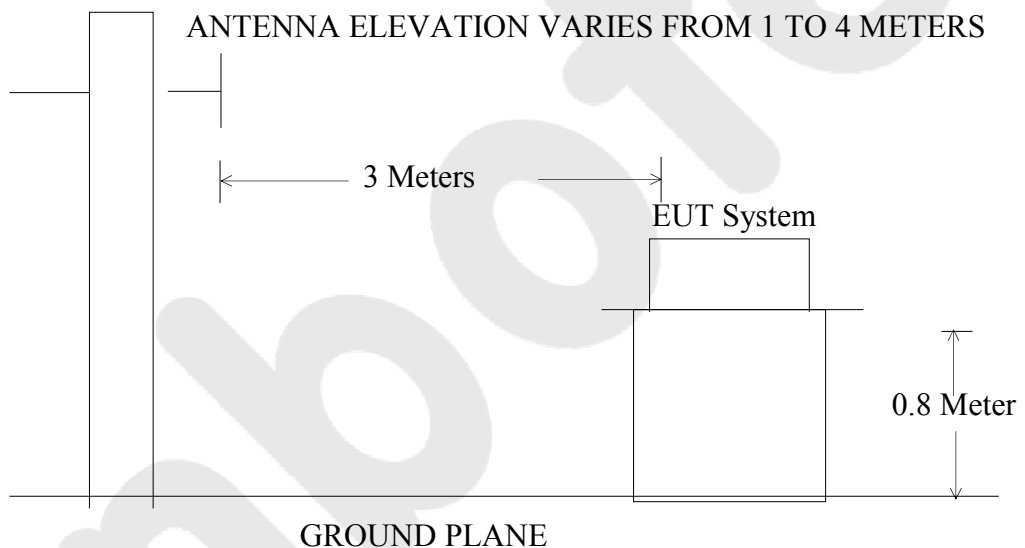
3. RADIATED EMISSION TEST

3.1. Block Diagram of Test

3.1.1. Block diagram of connection between the EUT and simulators



3.1.2. Block diagram of test setup (In chamber)



3.2. Measuring Standard

EN 55022: 2010+AC: 2011

3.3. Radiated Emission Limits

3.3.1. EN 55022: 2010+AC: 2011

Radiated Emission Limits

All emanations from an EN 55022 device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

| FREQUENCY (MHz) | DISTANCE (Meters) | FIELD STRENGTHS LIMIT (dB μ V/m) |
|-----------------|-------------------|--------------------------------------|
| 30 ~ 230 | 3 | 50 |
| 230 ~ 1000 | 3 | 57 |

Note: (1) The smaller limit shall apply at the combination point between

two frequency bands.

- (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

3.4. EUT Configuration on Test

The EN 55022 regulations test method must be used to find the maximum emission during radiated emission measurement.

3.5. Operating Condition of EUT

3.5.1. Turn on the power.

3.5.2. Let the EUT work in test mode (On) and measure it.

3.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 3.8.

3.7. Test Equipment

The following test equipments are used during the radiated emission measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------------|-----------------|-----------|------------------|---------------|---------------|
| 1. | EMI Test Receiver | Rohde & Schwarz | ESPI | 101604 | Apr. 17, 2015 | 1 Year |
| 2. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | VULB 9163-289 | Apr. 20, 2015 | 1 Year |
| 3. | Pre-amplifier | SONOMA | 310N | 186860 | Apr. 17, 2015 | 1 Year |

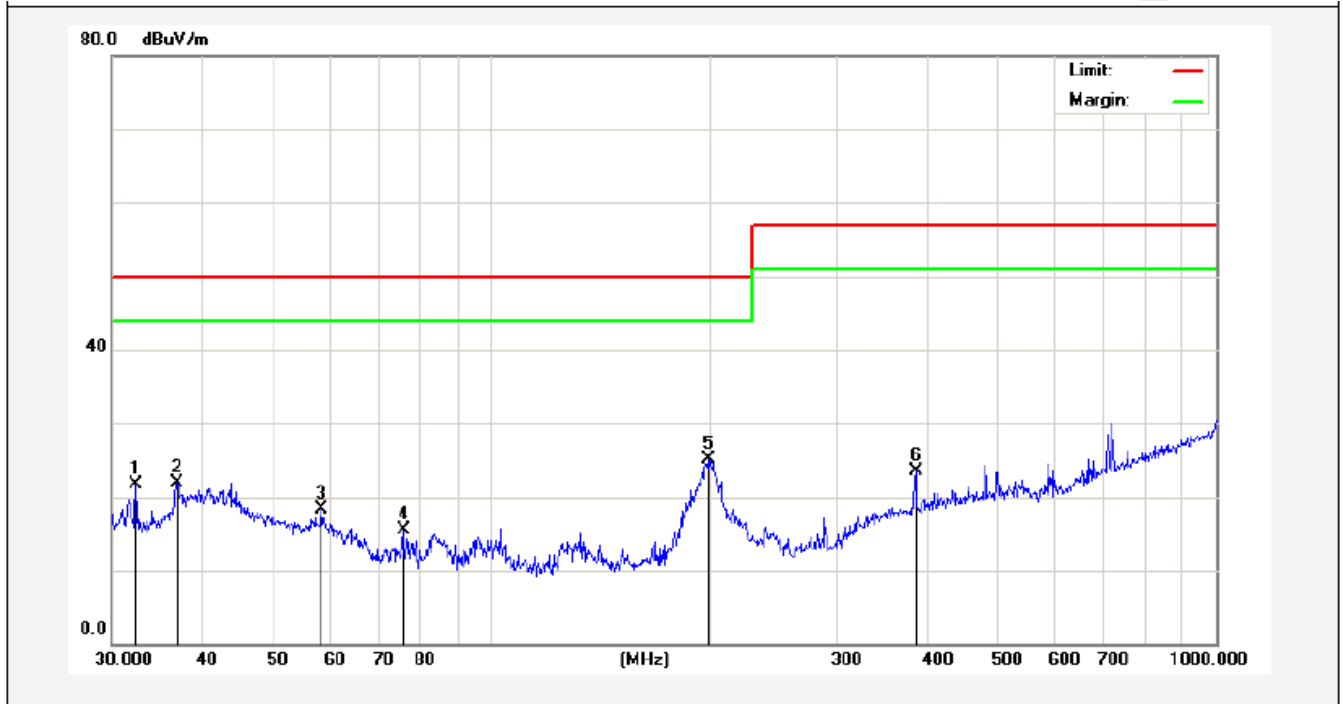
3.8. Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

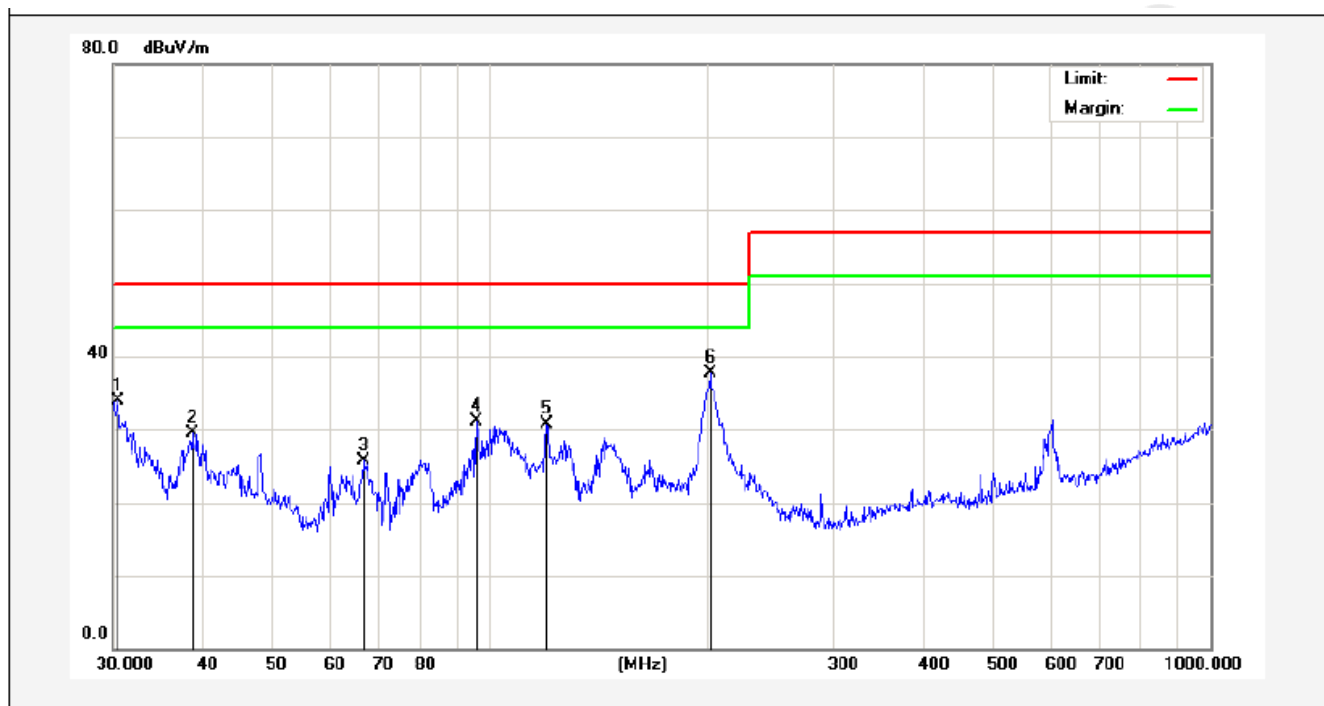
The test curves are shown in the following pages.

Job No.: AT011505295E **Polarization:** Horizontal
Standard: (RE)EN 55022_Class A_3m **Power Source:** DC 12V
Test item: Radiation Test **Temp.(C)/Hum.(%RH):** 24.3(C)/55%RH
Note: On **Distance:** 3m



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 32.4059 | 37.46 | -15.67 | 21.79 | 50.00 | -28.21 | peak | | | |
| 2 | 36.8953 | 34.71 | -12.79 | 21.92 | 50.00 | -28.08 | peak | | | |
| 3 | 58.4074 | 33.52 | -15.25 | 18.27 | 50.00 | -31.73 | peak | | | |
| 4 | 75.7114 | 36.28 | -20.79 | 15.49 | 50.00 | -34.51 | peak | | | |
| 5 | 199.2855 | 45.90 | -20.87 | 25.03 | 50.00 | -24.97 | peak | | | |
| 6 | 385.2805 | 36.67 | -13.16 | 23.51 | 57.00 | -33.49 | peak | | | |

| | | | |
|------------|-------------------------|---------------------|----------------|
| Job No.: | AT011505295E | Polarization: | Vertical |
| Standard: | (RE)EN 55022_Class A_3m | Power Source: | DC 12V |
| Test item: | Radiation Test | Temp.(C)/Hum.(%RH): | 24.3(C)/55%RH |
| Note: | On | Distance: | 3m |

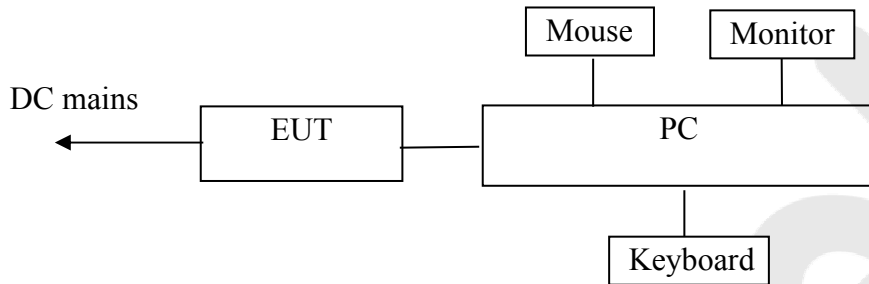


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 30.5306 | 50.53 | -16.66 | 33.87 | 50.00 | -16.13 | peak | | | |
| 2 | 38.6160 | 40.97 | -11.45 | 29.52 | 50.00 | -20.48 | peak | | | |
| 3 | 66.7325 | 43.86 | -18.21 | 25.65 | 50.00 | -24.35 | peak | | | |
| 4 | 95.7622 | 47.00 | -15.98 | 31.02 | 50.00 | -18.98 | peak | | | |
| 5 | 119.8556 | 47.06 | -16.32 | 30.74 | 50.00 | -19.26 | peak | | | |
| 6 | 202.1005 | 53.52 | -15.79 | 37.73 | 50.00 | -12.27 | peak | | | |

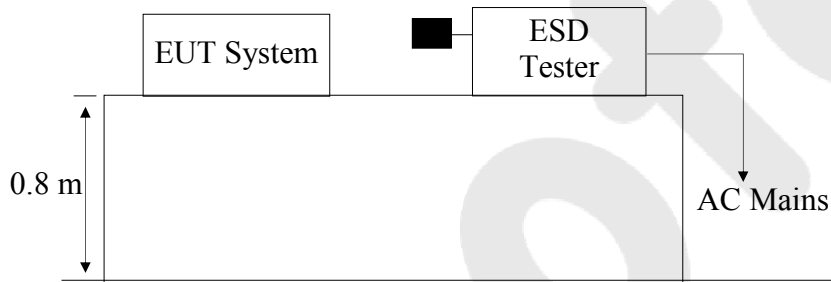
4. ELECTROSTATIC DISCHARGE IMMUNITY TEST

4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



4.1.2. Block diagram of test setup



4.2. Measuring Standard

EN 55024: 2010

IEC 61000-4-2

Severity Level: 3 / Air Discharge: $\pm 8\text{kV}$ Level: 2 / Contact Discharge: $\pm 4\text{kV}$

4.3. Severity Levels and Performance Criterion

4.3.1. Severity level

| Level | Test Voltage Contact Discharge (kV) | Test Voltage Air Discharge (kV) |
|-------|--|------------------------------------|
| 1. | ± 2 | ± 2 |
| 2. | ± 4 | ± 4 |
| 3. | ± 6 | ± 8 |
| 4. | ± 8 | ± 15 |
| X | Special | Special |

4.3.2. Performance criterion: **B**

4.4. EUT Configuration

The following equipments are installed on Electrostatic Discharge immunity Measurement to meet EN 55024 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 2.5 except the test set up replaced by Section 4.1.

4.6. Test Procedure

4.6.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 100 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

4.6.2. Contact Discharge:

All the procedure shall be same as Section 4.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

4.6.3. Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

4.6.4. Indirect discharge for vertical coupling plane

At least 50 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

4.7. Test Equipment

The following test equipments are used during the electrostatic discharge immunity measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------|--------------|-----------|------------|---------------|---------------|
| 1. | ESD Simulators | KIKUSUI | KES4021 | LJ003477 | Apr. 20, 2015 | 1 Year |

4.8. Measuring Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Results

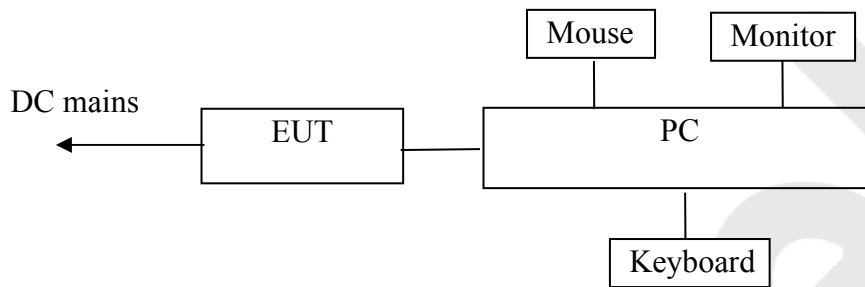
Shenzhen Anbotek Compliance Laboratory Limited

| | | |
|---|---|---------------|
| Test Mode : On | Temperature : 25°C | |
| Air discharge : ±8.0kV | Humidity : 54% | |
| Contact discharge: ±4.0kV | Criterion : B | |
| Power Supply : DC 12V | | |
| Location | Kind A-Air Discharge C-Contact Discharge | Result |
| Slot of the EUT 6 points | A | PASS |
| Others 6 points | A | PASS |
| Screws 6 points | C | PASS |
| HCP 4 points | C | PASS |
| VCP of front 4 points | C | PASS |
| VCP of rear 4 points | C | PASS |
| VCP of left 4 points | C | PASS |
| VCP of right 4 points | C | PASS |
| | | |
| | | |
| Note: | | |

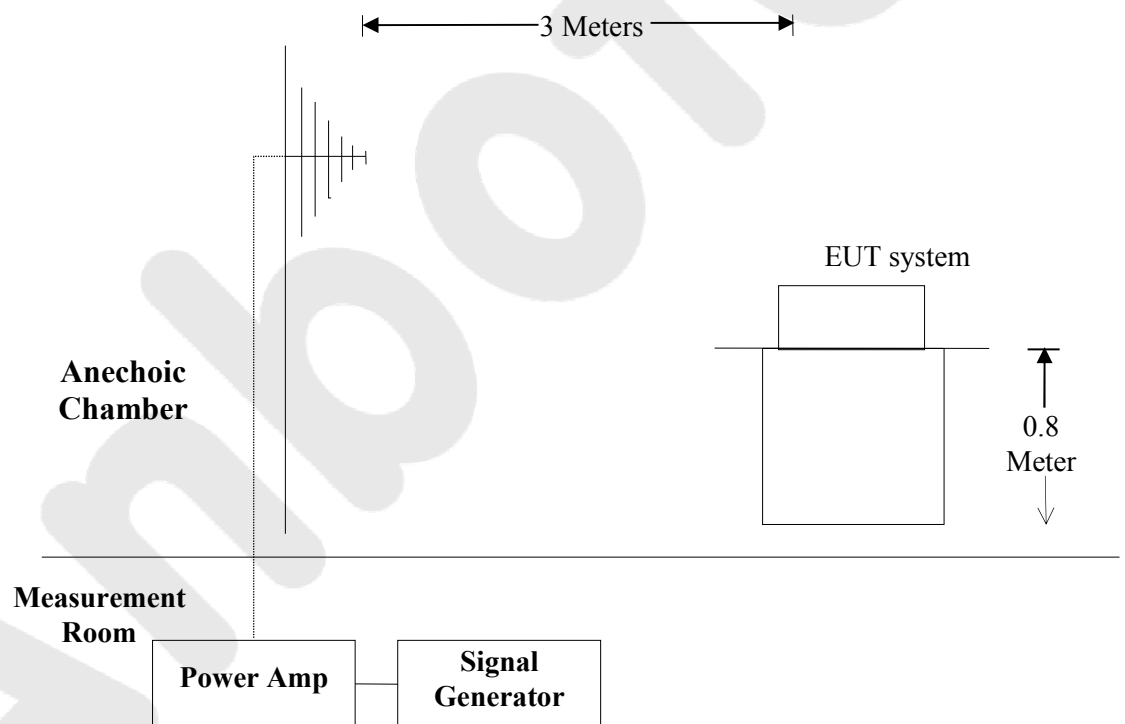
5. RF FIELD STRENGTH SUSCEPTIBILITY TEST

5.1. Block Diagram of Test

5.1.1. Block diagram of connection between the EUT and simulators



5.1.2. Block diagram of RS test setup



5.2. Measuring Standard

EN 55024: 2010
IEC 61000-4-3
Severity Level: 2, 3V / m

5.3. Severity Levels and Performance Criterion

5.3.1. Severity Levels

| Level | Field Strength V/m |
|-------|--------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

5.3.2. Performance Criterion: A

5.4. EUT Configuration on Test

The following equipments are installed on RF Field Strength susceptibility Measurement to meet EN 55024 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

5.5. Operating Condition of EUT

Same as conducted emission measurement which is listed in Section 2.5. except the test setup replaced as Section 5.1.

5.6. Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor its screen. All the scanning conditions are as following:

| Condition of Test | Remark |
|---------------------------|-------------------------|
| 1. Fielded Strength | 3V/m (Severity Level 2) |
| 2. Radiated Signal | Unmodulated |
| 3. Scanning Frequency | 80-1000MHz |
| 4. Sweep time of radiated | 0.0015 Decade/s |
| 2. Dwell Time | 1 Sec. |

5.7. Test Equipment

The following test equipments are used during the RF Field Strength susceptibility measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------------------|--------------|-----------------|-----------------|--------------|---------------|
| 1. | RF Power Meter. Dual Channel | BOONTON | 4232A | 10539 | May 29, 2014 | 1 year |
| 2. | 50ohm Diode Power Sensor | BOONTON | 51011EMC | 34236/342 38 | May 29, 2014 | 1 year |
| 3. | Broad-Band Horn Antenna | SCHWARZBECK | BBHA9120 L3F | 332 | May 29, 2014 | 1 year |
| 4. | Power Amplifier | PRANA | AP32MT215 | N/A | May 29, 2014 | 1 year |
| 5. | Power Amplifier | MILMEGA | AS0102-55 | N/A | May 29, 2014 | 1 year |
| 6. | Signal Generator | AEROFLEX | 2023B | N/A | May 29, 2014 | 1 year |
| 7. | Field Strength Meter | HOLADAY | HI-6005 | N/A | May 29, 2014 | 1 year |
| 8. | RS232 Fiber Optic Modem | HOLADAY | HI-4413P | N/A | May 29, 2014 | 1 year |
| 9. | Log.-Per. Antenna | SCHWARZBECK | VULP 9118E | N/A | May 29, 2014 | 1 year |

5.8. Measuring Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

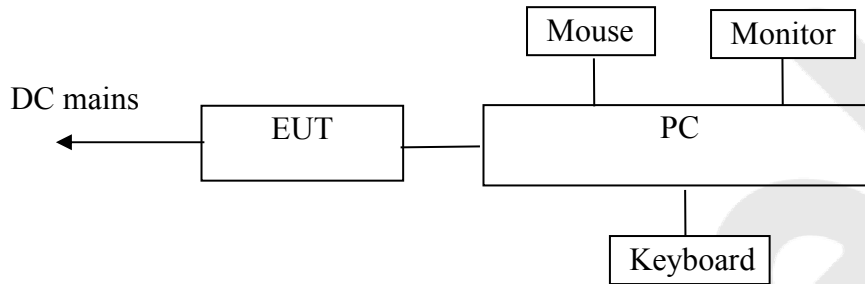
Shenzhen Anbotek Compliance Laboratory Limited

| | | | |
|--|-------------------------------------|----------|--------------------------|
| Test Mode : On | Temperature : 25°C | | |
| Field Strength : 3 V/m | Humidity : 54% | | |
| Criterion : A | Frequency Range: 80 MHz to 1000 MHz | | |
| Power Supply : AC 230, 50Hz | | | |
| Modulation: <input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80% | | | |
| | Frequency Rang 1: 80~ 1000MHz | | Frequency Rang 2: |
| Steps | # / % | # / % | # / % |
| | Horizontal | Vertical | Horizontal Vertical |
| Front | PASS | PASS | |
| Right | PASS | PASS | |
| Rear | PASS | PASS | |
| Left | PASS | PASS | |
| Test Equipment : | | | |
| Note: Tested by EMTEK. | | | |

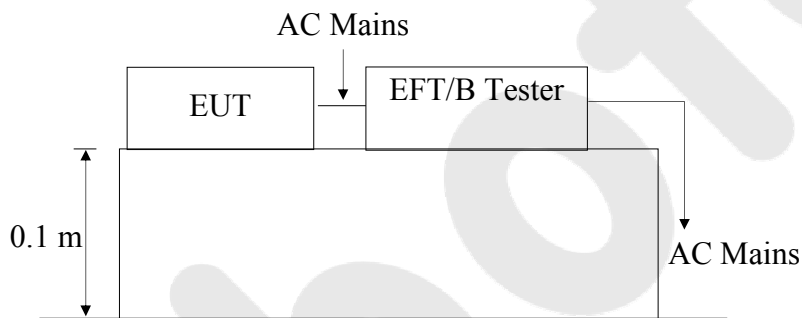
6. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

6.1. Block Diagram of Test Setup

6.1.1. Block diagram of connection between the EUT and simulators



6.1.2. EFT Test Setup



6.2. Measuring Standard

EN 55024: 2010
IEC 61000-4-4
Severity Level, Level 2: 1kV

6.3. Severity Levels and Performance Criterion

6.3.1. Severity level

| Open Circuit Output Test Voltage $\pm 10\%$ | | |
|---|-----------------------|---|
| Level | On Power Supply Lines | On I/O (Input/Output) Signal data and control lines |
| 1. | 0.5 kV | 0.25 kV |
| 2. | 1 kV | 0.5 kV |
| 3. | 2 kV | 1 kV |
| 4. | 4 kV | 2 kV |
| X | Special | Special |

6.3.2. Performance criterion: **B**

6.4. EUT Configuration

The following equipments are installed on Electrical Fast Transient/Burst Immunity Measurement to meet EN 55024 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

6.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 2.5, except the test set up replaced by Section 6.1.

6.6. Test Procedure

The EUT is put on the table which is 0.1 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

6.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

6.6.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

6.6.3. For DC output line ports:

It's unnecessary to test.

6.7. Test Equipment

The following test equipments are used during the electrical fast transient/burst immunity measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------|--------------|-----------|------------|---------------|---------------|
| 1. | EFT Burst Simulator | PRIMA | EFT61004B | PR10114282 | Apr. 17, 2015 | 1 Year |

6.8. Measuring Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

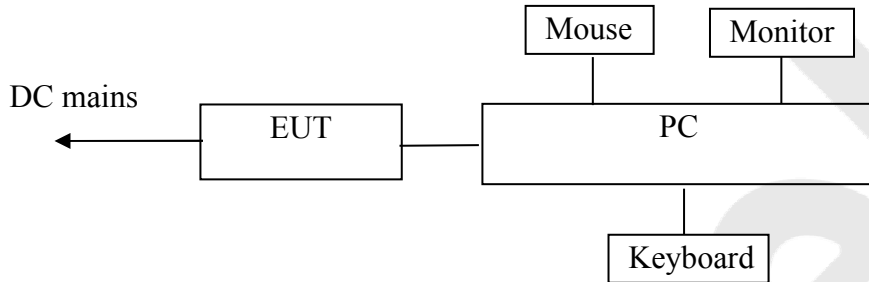
Shenzhen Anbotek Compliance Laboratory Limited

| | | | |
|---------------------------------|-----------------------|---------------------|-----------|
| Operation Mode: <u>On</u> | | criterion: B | |
| Power Supply: <u>DC 12V</u> | | | |
| Ambient Condition : <u>24°C</u> | | <u>55% RH</u> | |
| | | | |
| Inject Line : AC Mains | Inject Method: Direct | Inject Time(s): 120 | |
| Line | Test Voltage | Result(+) | Result(-) |
| + | 1kV | PASS | PASS |
| - | 1kV | PASS | PASS |
| PE | | | |
| +、- | 1kV | PASS | PASS |
| +、PE | | | |
| -、PE | | | |
| +、-、PE | | | |
| Signal Line | | | |
| DC Line | | | |
| Note : | | | |
| Remark: | | | |

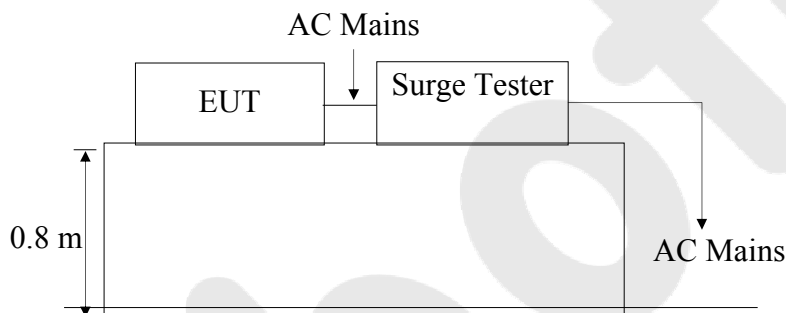
7. SURGE IMMUNITY TEST

7.1. Block Diagram of Test Setup

7.1.1. Block diagram of connection between the EUT and simulators



7.1.2. Surge Test Setup



7.2. Measuring Standard

EN 55024: 2010

IEC 61000-4-5

Severity Level: Level 2, Line to Line: 1.0kV;

7.3. Severity Levels and Performance Criterion

7.3.1. Severity level

| Severity Level | Open-Circuit Test Voltage kV |
|----------------|---------------------------------|
| 1 | 0.5 |
| 2 | 1.0 |
| 3 | 2.0 |
| 4 | 4.0 |
| * | Special |

7.3.2. Performance criterion: **B**

7.4. EUT Configuration

The following equipments are installed on SURGE immunity Measurement to meet EN 55024 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

7.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 2.5, except the test set up replaced by Section 7.1.1.

7.6. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 9.1.2.
- 2) For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) For line to earth coupling mode, provide a 2.0 kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 4) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 5) Different phase angles are done individually.
- 6) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

7.7. Test Equipment

The following test equipments are used during the surge immunity measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------|--------------|-----------|---------------|---------------|---------------|
| 1. | 6kV Surge Generator | EMPEK | LSG-5060G | 06010017 N | Apr. 17, 2015 | 1 Year |
| 2. | CDN | EMPEK | CDN-5110G | 06110005 N | Apr. 17, 2015 | 1 Year |

7.8. Measuring Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

Shenzhen Anbotek Compliance Laboratory Limited

| | |
|--|-----------------------------------|
| Test Mode: On Humidity: 55% Power Supply: DC 12V | Temperature: 24°C Criterion: B |
|--|-----------------------------------|

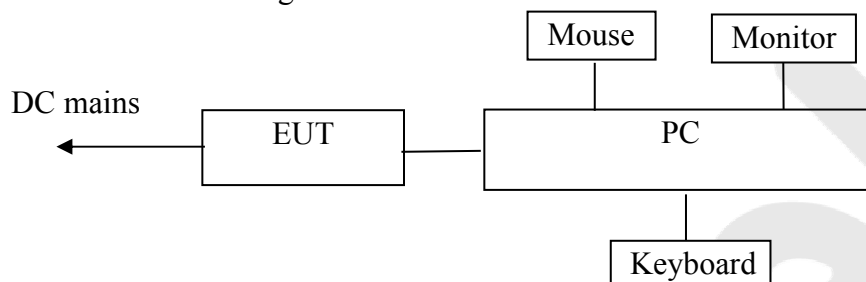
| Location | Polarity | Phase Angle | Number of Pulse | Pulse Voltage (kV) | Result |
|--------------------|----------|-------------|-----------------|--------------------|--------|
| Positive- Negative | + | 0° | 5 | 1.0 | PASS |
| | + | 90° | 5 | 1.0 | PASS |
| | + | 180° | 5 | 1.0 | PASS |
| | + | 270° | 5 | 1.0 | PASS |
| | - | 0° | 5 | 1.0 | PASS |
| | - | 90° | 5 | 1.0 | PASS |
| | - | 180° | 5 | 1.0 | PASS |
| | - | 270° | 5 | 1.0 | PASS |
| Positive- PE | | | | | |
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Remark:

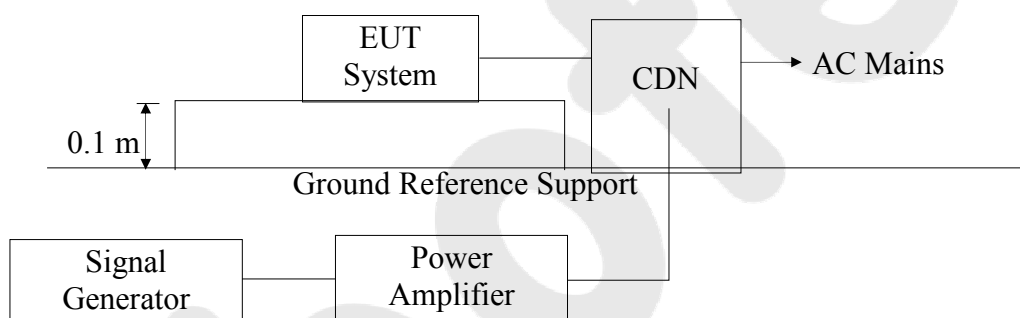
8. INJECTED CURRENTS SUSCEPTIBILITY TEST

8.1. Block Diagram of Test Setup

8.1.1. Block diagram of connection between the EUT and simulators



8.1.2. Block Diagram of Test Setup



8.2. Measuring Standard

EN 55024: 2010

IEC 61000-4-6, Severity Level: 3V (rms), (0.15MHz ~ 80MHz)

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

| Level | Field Strength V(rms) |
|-------|-----------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

8.3.2. Performance criterion: A

8.4. EUT Configuration

The following equipments are installed on currents susceptibility Measurement to

meet EN 55024 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

8.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 2.5, except the test set up replaced by Section 8.1.1.

8.6. Test Procedure

8.6.1. For AC Mains

- 1) Set up the EUT, CDN and test generators as shown on Section 8.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.8m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

8.6.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

8.6.3. For DC output line ports:

It's unnecessary to test.

8.7. Test Equipment

The following test equipments are used during the Injected currents susceptibility measurement:

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|------------------------------------|--------------|--------------|---------------|---------------|---------------|
| 1. | C/S Conducted Immunity Test System | FRANKONIA | CIT-10 | 126A1196/2012 | Apr. 17, 2015 | 1 Year |
| 2. | CDN | FRANKONIA | CDN - M2+ M3 | A2210178/2012 | Apr. 17, 2015 | 1 Year |
| 3. | 6dB attenuator | FRANKONIA | DAM 26W | 1172202 | Apr. 17, 2015 | 1 Year |

8.8. Measuring Results

PASS.

Please refer to the following page.

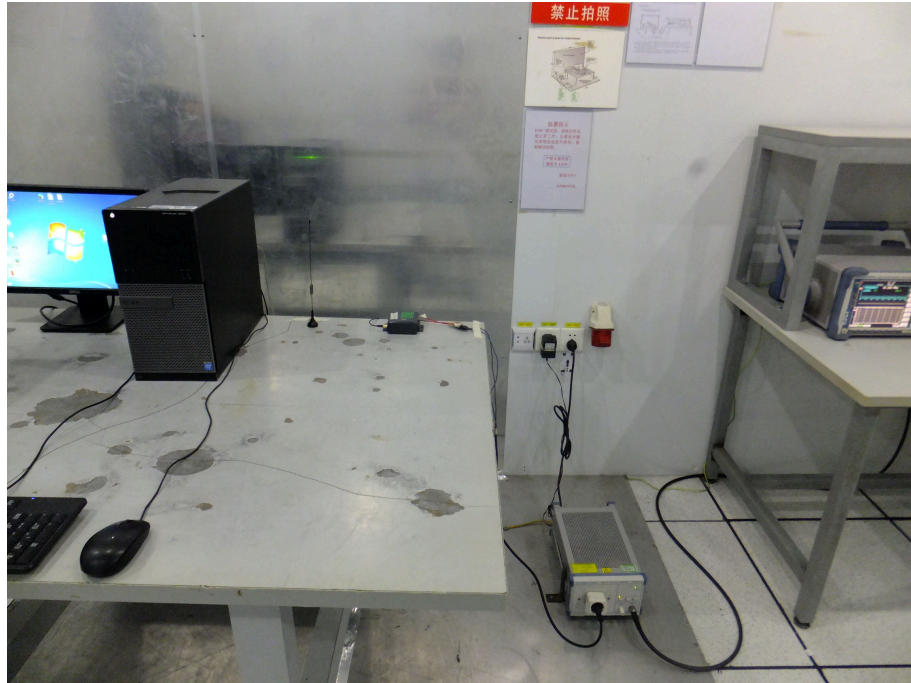
Injected Currents Susceptibility Test Results

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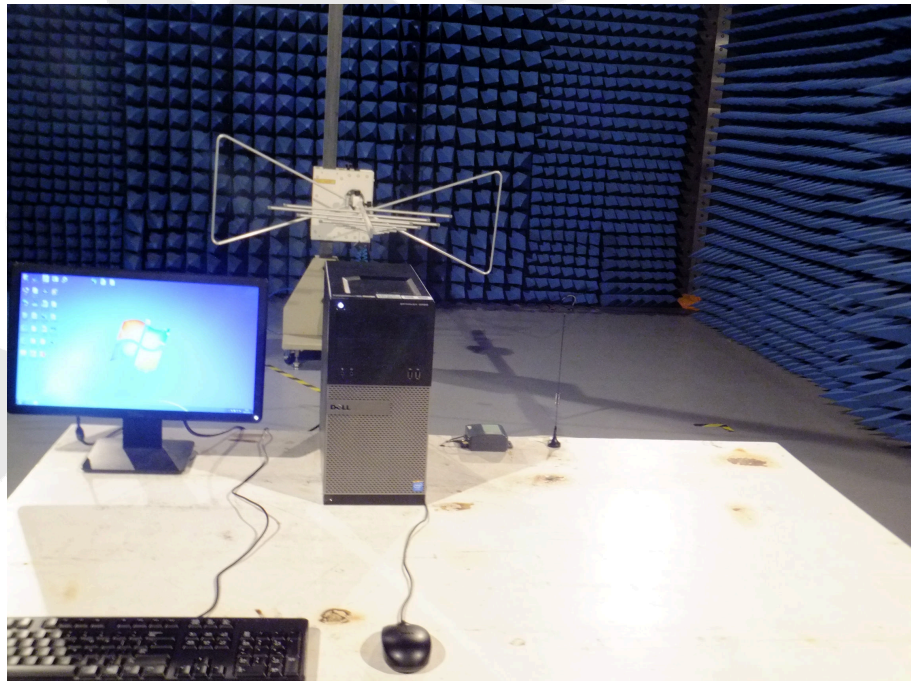
| Test Mode : On | | Temperature : 24°C | | |
|-----------------------|-------------------|------------------------|-----------|--------|
| Power Supply : DC 12V | | Humidity : 53% | | |
| | | | | |
| Frequency Range (MHz) | Injected Position | Strength (Unmodulated) | Criterion | Result |
| 0.15 ~ 80 | AC Mains | 3V | A | PASS |
| | | | | |
| Test Mode : | | | | |
| Frequency Range (MHz) | Injected Position | Strength (Unmodulated) | Criterion | Result |
| | | | | |
| | | | | |
| Remark : | | Note: | | |
| | | | | |

9. PHOTOGRAPHS

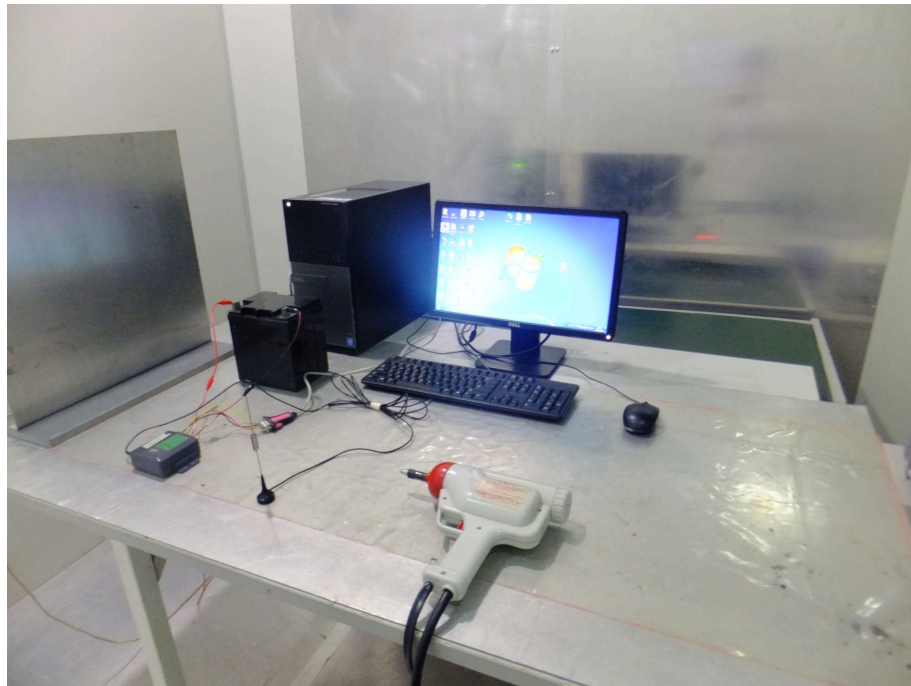
9.1. Photo of Power Line Conducted Emission Test



9.2. Photo of Radiated Emission Test



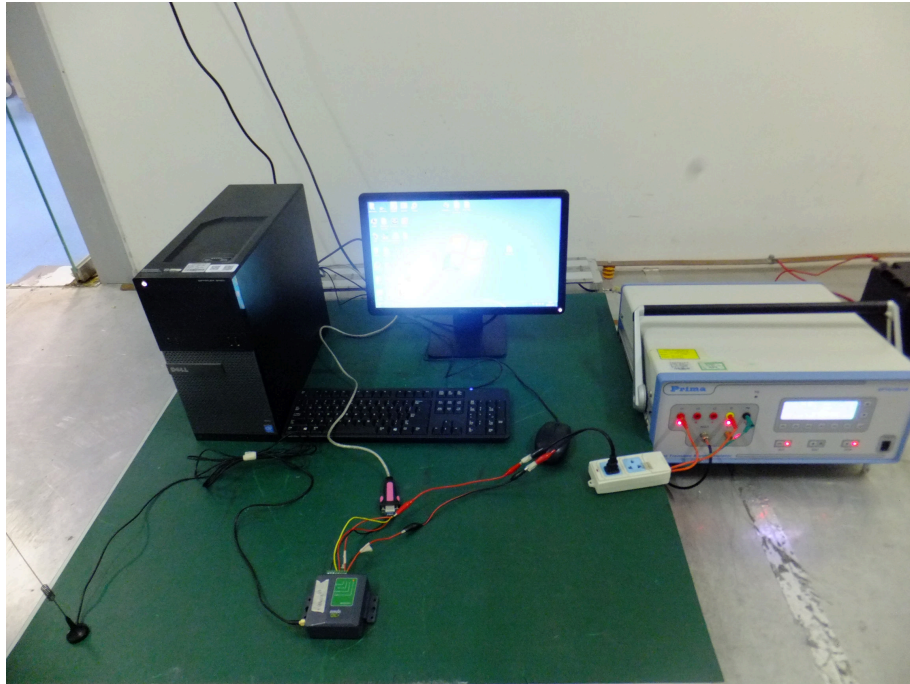
9.3. Photo of Electrostatic Discharge Test



9.4. Photo of RF Field Strength susceptibility Test



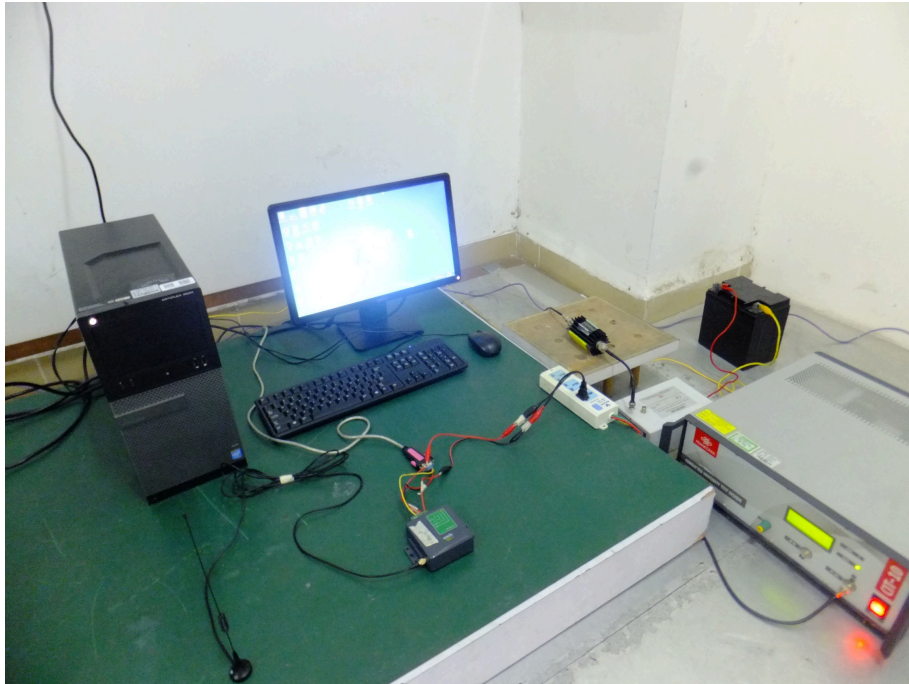
9.5. Photo of Electrical Fast Transient/Burst Immunity Test



9.6. Photo of Surge Immunity Test



9.7. Photo of Injected currents susceptibility Test



APPENDIX I
(Photos of EUT)

Figure 1
The EUT- Front View

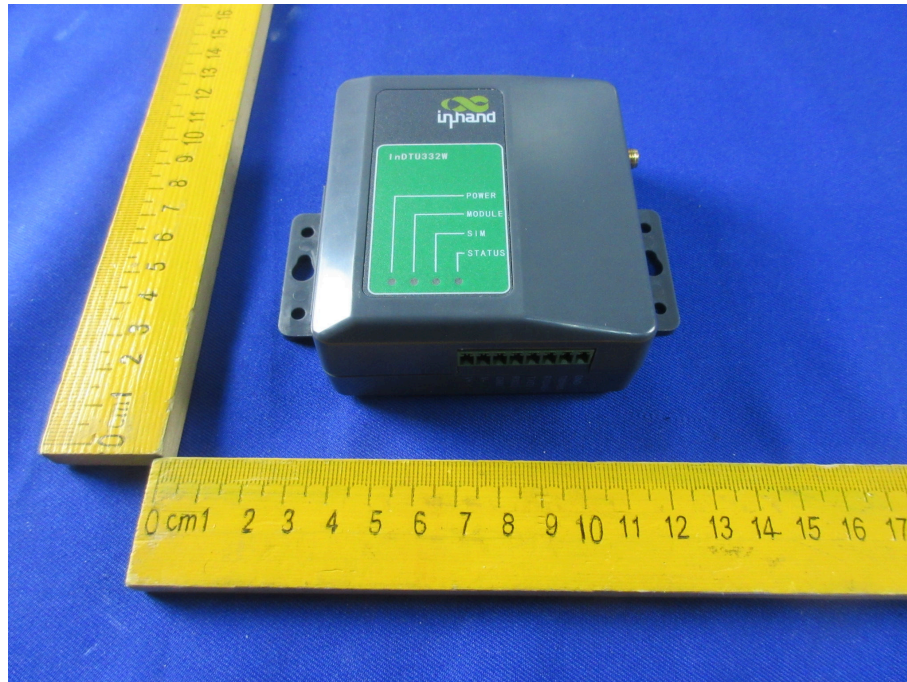


Figure 2
The EUT- Back View



Figure 3
The EUT- Inside View

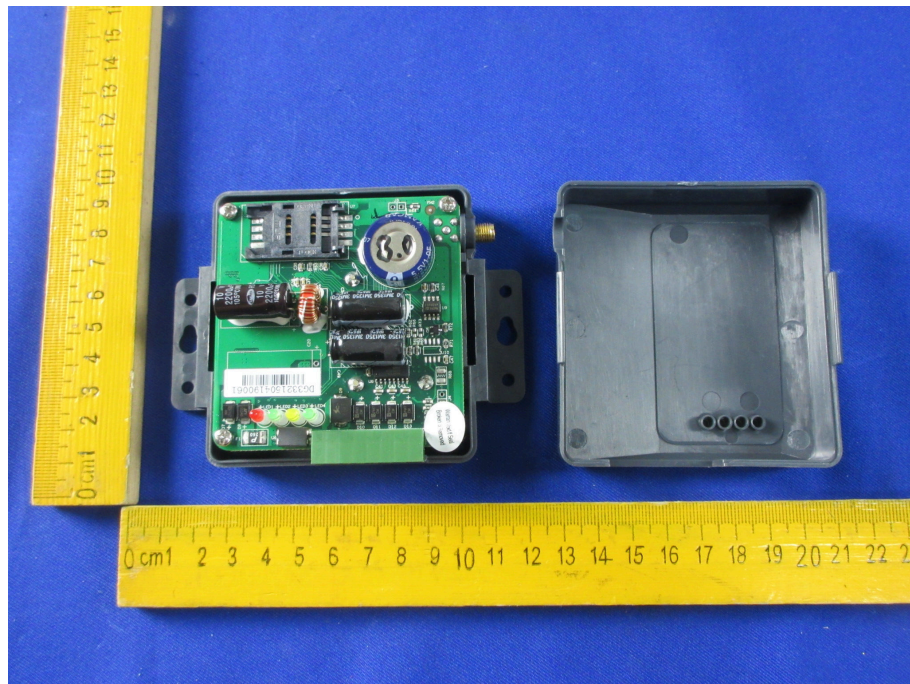


Figure 5
PCB of The EUT-Front View

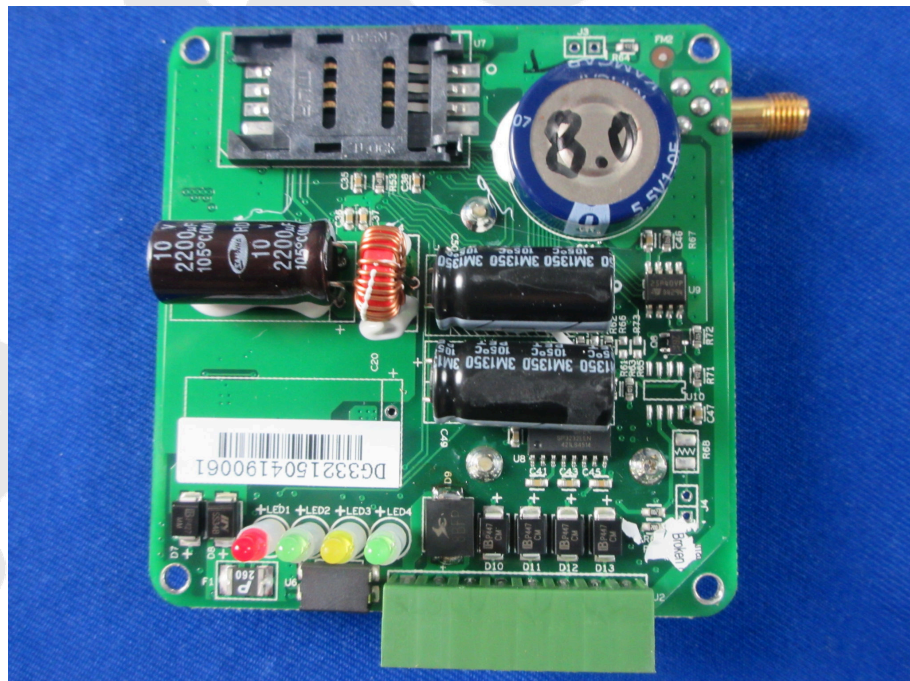
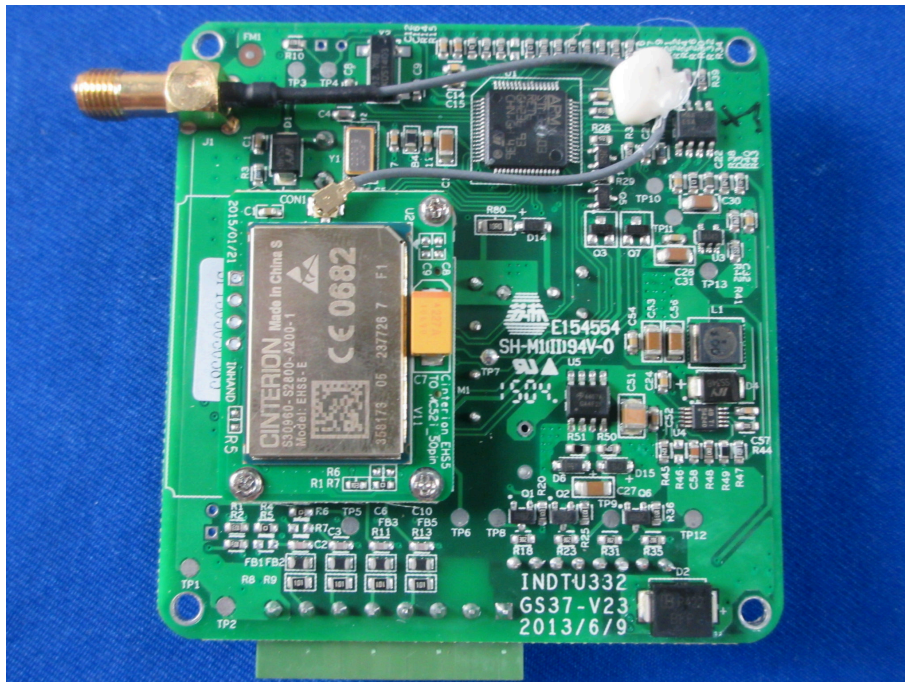


Figure 6
PCB of The EUT-Back View



CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:
If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.
3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.
4. The CE marking must be affixed visibly, legibly and indelibly.
It must have the same height as the initials 'CE'.