

EN 55022:2010  
EN 55024:2010  
EN 61000-3-2:2006 + A1:2009 + A2:2009  
EN 61000-3-3:2008

## TEST REPORT

For

**YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD**

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**Model: SIP-T28P, SIP-T28**

|                                       |                                                                                                                                                                                                                                                                                             |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Amended Report | <b>Product Type:</b><br>IP PHONE                                                                                                                                                                                                                                                            |
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| <b>Report Number:</b>                 | RSZ130614003-01A2                                                                                                                                                                                                                                                                           |
| <b>Report Date:</b>                   | 2013-07-02<br>Dick Zhang <i>Dick Zhang</i>                                                                                                                                                                                                                                                  |
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**DOCUMENT REVISION HISTORY**

| Revision Number | Report Number     | Description of Revision | Date of Revision |
|-----------------|-------------------|-------------------------|------------------|
| 0               | RSZ110725004-01   | Original Report         | 2011-08-29       |
| 1               | RSZ121211014-01A1 | Amended Report          | 2012-12-17       |
| 2               | RSZ130614003-01A2 | Amended Report          | 2013-07-02       |

Note:

**Note:**

This is an amended report application based on RSZ121211014-01A1, the details as below

Adding two new adapters: OH-1006B0501200U-VDE and NSA6EE-050120

Based on the above difference, it affects test items “Conducted Disturbance” and “Radiated Disturbance”, so the related test items were performed, related setup photos and EUT photos were updated, and the other test data and photos were copied from the original report RSZ121211014-01A1 that issued on 2012-12-17.

## GENERAL INFORMATION

---

### Product Description for Equipment Under Test (EUT)

The YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD 's product, model number: SIP-T28P (the "EUT") in this report is an IP PHONE, which was measured approximately: 27.9 cm (L) x 20.3 cm (W) x 11.5 cm (H), rated input voltage: DC 5V from adapter.

Adapter 1 (original) information:

Model: OH-1048A0501200U2-VDE

Input: AC 100-240V, 50/60Hz, 250mA

Output: DC 5V, 1.2A

Adapter 2 (new) information:

Model: OH-1006B0501200U-VDE

Input: AC 100-240V, 50/60Hz, 250mA

Output: DC 5V, 1.2A

Adapter 3 (new) information:

Model: NSA6EE-050120

Input: AC 100-240V, 50/60Hz, 0.2A

Output: DC 5V, 1.2A

*Note: The serial product, model SIP-T28P and SIP-T28 are electrically identical, they just have different model name, and we select SIP-T28P to test, which was explained in the attached declaration letter.*

*\*All measurement and test data in this report was gathered from production sample serial number: 1306028 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-06-14.*

### Objective

This test report is prepared on behalf of YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD in accordance with EN 55022: Information technology equipment-Radio disturbance characteristics-Limits and methods of measurement. EN 55024: Information technology equipment- Immunity characteristics – Limits and methods of measurement. EN 61000-3-2, Limits – Limits for harmonic current emissions (equipment input current up to and including 16 A per phase), and also in accordance with EN 61000-3-3, Limits Section 3; Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <16A.

The objective of the manufacturer is to determine compliance with EN 55022, EN 55024, EN 61000-3-2 and EN 61000-3-3.

### Related Submittal(s)/Grant(s)

No related submittal(s).

## Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1:2010, specification for radio disturbance and immunity measuring apparatus and methods P1-1: radio disturbance and immunity measuring apparatus measuring apparatus. CISPR 16-1-4:2012, Specification for radio disturbance and immunity measuring apparatus and methods-Part 1-4: Radio disturbance and immunity measuring apparatus -Ancillary equipment -Radiated disturbances. CISPR 16-2-1:2010, specification for radio disturbance and immunity measuring apparatus and methods P2-1: methods of measurement of disturbance and immunity conducted disturbance measurements. CISPR 16-2-3:2010, specification for radio disturbance and immunity measuring apparatus and methods P2-3 methods of measurement of disturbances and immunity radiated disturbance measurements. CISPR 16-4-2:2011, Specification for radio disturbance and immunity measuring apparatus and methods-Part 4-2: Uncertainties, statistics and limit modeling-Uncertainty in EMC measurements

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 Meters.

## Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a manufacturer testing fashion.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

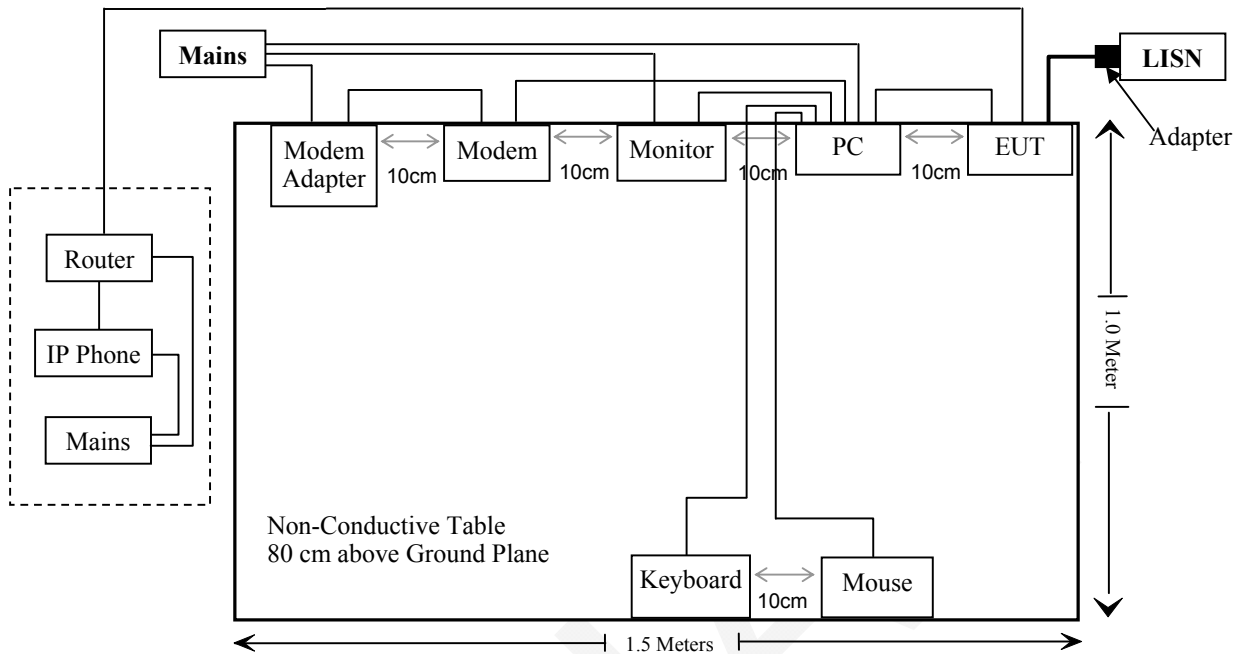
| Manufacturer | Description | Model    | Serial Number            |
|--------------|-------------|----------|--------------------------|
| DELL         | PC          | 127BPX2  | N/A                      |
| DELL         | Monitor     | E178WFPC | CN-OWY564-64180-7C4-2SQH |
| DELL         | Mouse       | MOC5UO   | G1B0096D                 |
| DELL         | Keyboard    | L100     | CNORH656658907BL04TY     |
| Sagemcom     | Router      | N/A      | N/A                      |
| Yealink      | IP phone    | SIP-T41P | N/A                      |
| ECOM         | Modem       | 5600pbs  | N/A                      |

### External I/O Cable

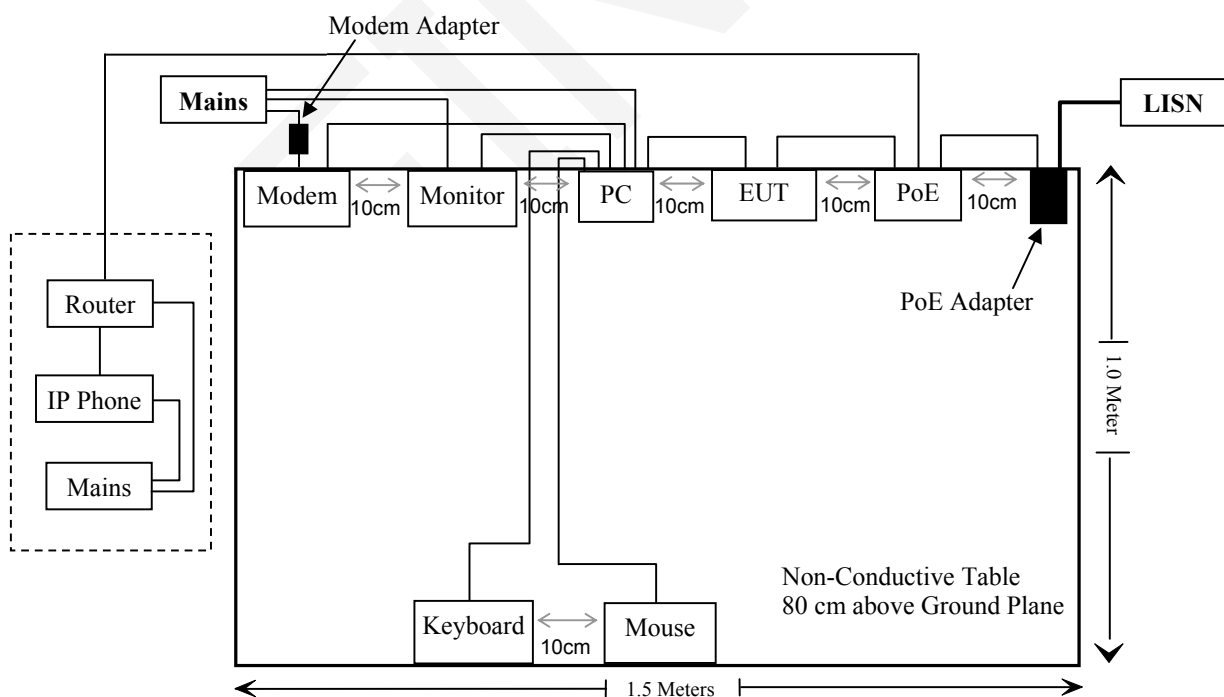
| Cable Description                 | Length (m) | From/Port | To       |
|-----------------------------------|------------|-----------|----------|
| Shielded Undetachable K/B Cable   | 1.5        | K/B       | PC       |
| Shielded Undetachable Mouse Cable | 1.5        | Mouse     | PC       |
| Shielded Undetachable VGA Cable   | 1.5        | Monitor   | PC       |
| Unshielded Detachable AC Cable    | 1.0        | Main      | Monitor  |
| Unshielded Detachable RS232 Cable | 1.5        | Modem     | PC       |
| Unshielded Detachable RJ45 Cable  | 1.5        | EUT       | PC       |
| Unshielded Detachable DC Cable    | 1.8        | Main      | EUT      |
| Unshielded Detachable AC Cable    | 1.0        | Main      | PC       |
| Unshielded Detachable RJ45 Cable  | 10         | EUT       | Router   |
| Unshielded Detachable DC Cable    | 1.5        | Main      | Router   |
| Unshielded Detachable DC Cable    | 1.8        | Main      | IP Phone |
| Unshielded Detachable RJ45 Cable  | 1.5        | Router    | IP Phone |

**Block Diagram of Test Setup**

## 1) Adapter power supply:



## 2) PoE power supply:



**SUMMARY OF TEST REPORT****EN 55022**

| RULE  | DESCRIPTION                                     | RESULTS    |
|-------|-------------------------------------------------|------------|
| § 5.1 | Conducted Disturbance at Mains Terminals        | Compliance |
| § 5.2 | Conducted Disturbance at Telecommunication Port | Compliance |
| § 6   | Radiated Disturbance                            | Compliance |

**EN 55024**

| RULE     | DESCRIPTION                                    | RESULTS    |
|----------|------------------------------------------------|------------|
| §4.2.1   | Electrostatic Discharge IEC 61000-4-2          | Compliance |
| §4.2.2   | Electrical Fast Transients IEC 61000-4-4       | Compliance |
| §4.2.3.1 | Continuous Radiated Disturbance IEC 61000-4-3  | Compliance |
| §4.2.3.2 | Continuous Conducted Disturbance IEC 61000-4-6 | Compliance |
| §4.2.4   | Power Frequency Magnetic Fields IEC 61000-4-8  | Compliance |
| §4.2.5   | Surges IEC 61000-4-5                           | Compliance |
| §4.2.6   | Voltage Dips And Interruptions, IEC 61000-4-11 | Compliance |

**EN 61000-3-2**

| RULE | DESCRIPTION                | RESULTS    |
|------|----------------------------|------------|
|      | Harmonic Current Emissions | Compliance |

**EN 61000-3-3**

| RULE | DESCRIPTION                     | RESULTS    |
|------|---------------------------------|------------|
|      | Voltage Fluctuation and Flicker | Compliance |

## EN 55022 §5.1-CONDUCTED DISTURBANCE AT MAINS TERMINALS AND TELECOMMUNICATION PORT

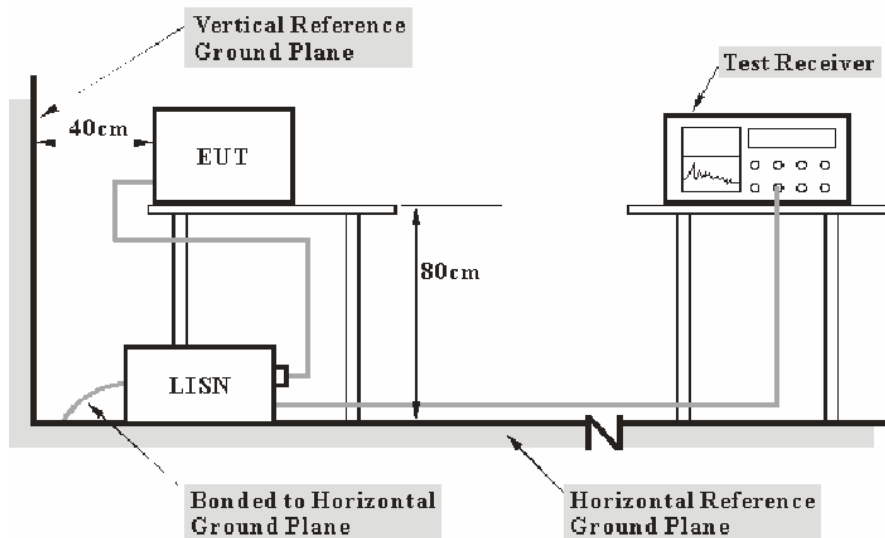
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

| Port     | Measurement uncertainty                |
|----------|----------------------------------------|
| AC Mains | 3.26 dB (k=2, 95% level of confidence) |
| CAT 3    | 3.70 dB (k=2, 95% level of confidence) |
| CAT 5    | 3.86 dB (k=2, 95% level of confidence) |
| CAT 6    | 4.64 dB (k=2, 95% level of confidence) |

### Test System Setup



Note: 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-2-1:2010 measurement procedure. The related limit was specified in the EN 55022 Class B.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter and PoE adapter were connected to a 230VAC/50 Hz power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

### Test Equipment List and Details

| Manufacturer    | Description       | Model     | Serial Number          | Calibration Date | Calibration Due Date |
|-----------------|-------------------|-----------|------------------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCS30    | 100176                 | 2013-06-17       | 2014-06-17           |
| Rohde & Schwarz | L.I.S.N.          | ESH2-Z5   | 892107/021             | 2012-08-22       | 2013-08-21           |
| Schwarzbeck     | ISN               | NTFM 8158 | cat 5-8158-0010        | 2012-11-05       | 2013-11-05           |
| Rohde & Schwarz | Transient Limiter | ESH3Z2    | DE25985                | 2012-08-09       | 2013-08-09           |
| Rohde & Schwarz | LISN              | ENV216    | 3560.6650.12-101613-Yb | 2013-05-07       | 2014-05-07           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

During the conducted emission test, the adapters were connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

### Test Results Summary

According to the recorded data in following table, with the worst margin reading of:

**0.8 dB at 23.126000 MHz in the Line conducted mode (adapter 2 power supply)**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25 °C     |
| <b>Relative Humidity:</b> | 56 %      |
| <b>ATM Pressure:</b>      | 100.0 kPa |

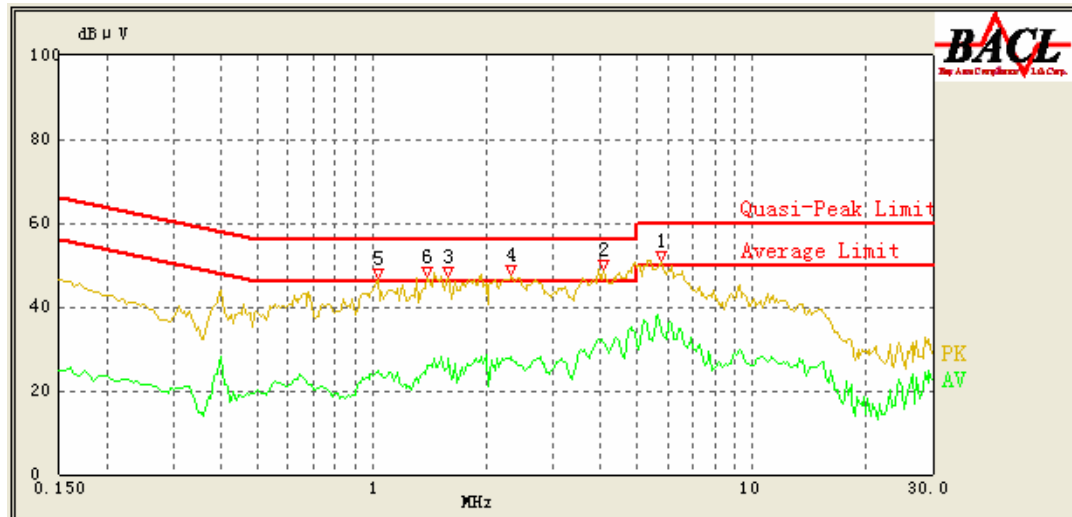
*The testing was performed by Joson Xiao on 2013-06-20.*

*Test Mode: Talking*

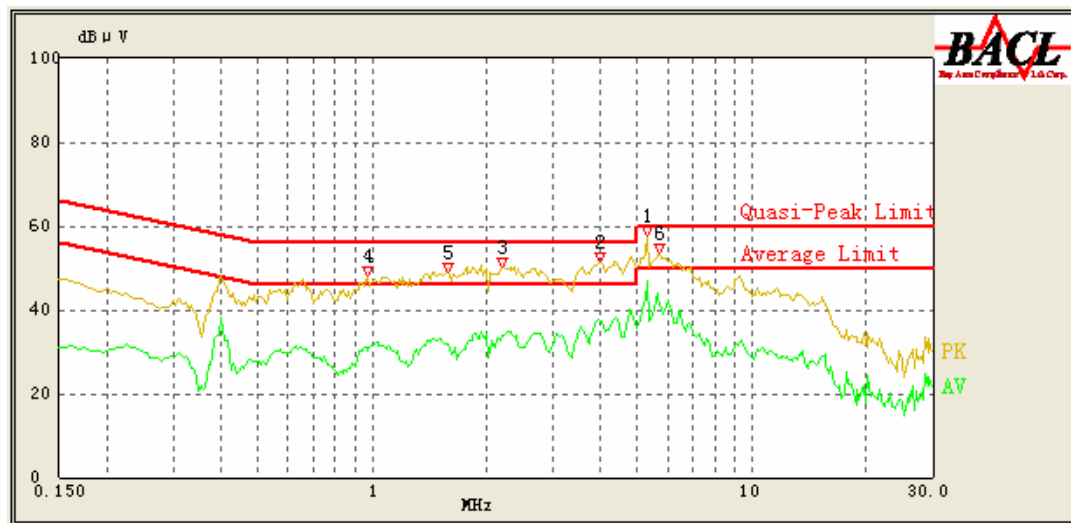
FINAL

1) Adapter 1 power supply:

AC 230V/50 Hz, Line:



| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 5.730           | 36.59                      | 10.10                  | 50.00        | 13.41       | Ave.                  |
| 4.065           | 31.40                      | 10.10                  | 46.00        | 14.60       | Ave.                  |
| 5.750           | 44.00                      | 10.10                  | 60.00        | 16.00       | QP                    |
| 4.080           | 39.45                      | 10.10                  | 56.00        | 16.55       | QP                    |
| 2.330           | 38.29                      | 10.10                  | 56.00        | 17.71       | QP                    |
| 1.585           | 37.90                      | 10.10                  | 56.00        | 18.10       | QP                    |
| 1.035           | 37.48                      | 10.10                  | 56.00        | 18.52       | QP                    |
| 1.395           | 37.38                      | 10.10                  | 56.00        | 18.62       | QP                    |
| 2.330           | 27.28                      | 10.10                  | 46.00        | 18.72       | Ave.                  |
| 1.390           | 26.02                      | 10.10                  | 46.00        | 19.98       | Ave.                  |
| 1.585           | 25.68                      | 10.10                  | 46.00        | 20.32       | Ave.                  |
| 1.035           | 24.60                      | 10.10                  | 46.00        | 21.40       | Ave.                  |

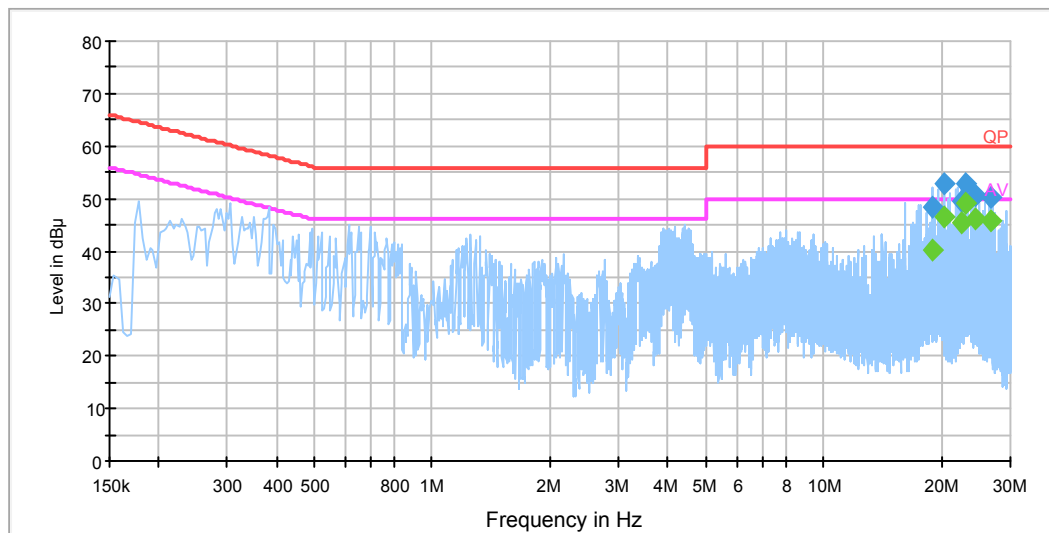
**AC 230V/50 Hz, Neutral:**

| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 5.325           | 46.94                      | 10.10                  | 50.00        | 3.06        | Ave.                  |
| 5.665           | 42.81                      | 10.10                  | 50.00        | 7.19        | Ave.                  |
| 4.005           | 37.49                      | 10.10                  | 46.00        | 8.51        | Ave.                  |
| 4.005           | 45.73                      | 10.10                  | 56.00        | 10.27       | QP                    |
| 5.695           | 48.72                      | 10.10                  | 60.00        | 11.28       | QP                    |
| 2.190           | 33.92                      | 10.10                  | 46.00        | 12.08       | Ave.                  |
| 5.320           | 47.54                      | 10.10                  | 60.00        | 12.46       | QP                    |
| 2.200           | 43.18                      | 10.10                  | 56.00        | 12.82       | QP                    |
| 1.580           | 41.83                      | 10.10                  | 56.00        | 14.17       | QP                    |
| 1.585           | 31.79                      | 10.10                  | 46.00        | 14.21       | Ave.                  |
| 0.970           | 41.54                      | 10.10                  | 56.00        | 14.46       | QP                    |
| 0.970           | 31.24                      | 10.10                  | 46.00        | 14.76       | Ave.                  |

## 2) Adapter 2 power supply:

**AC 230V/50 Hz, Line:**

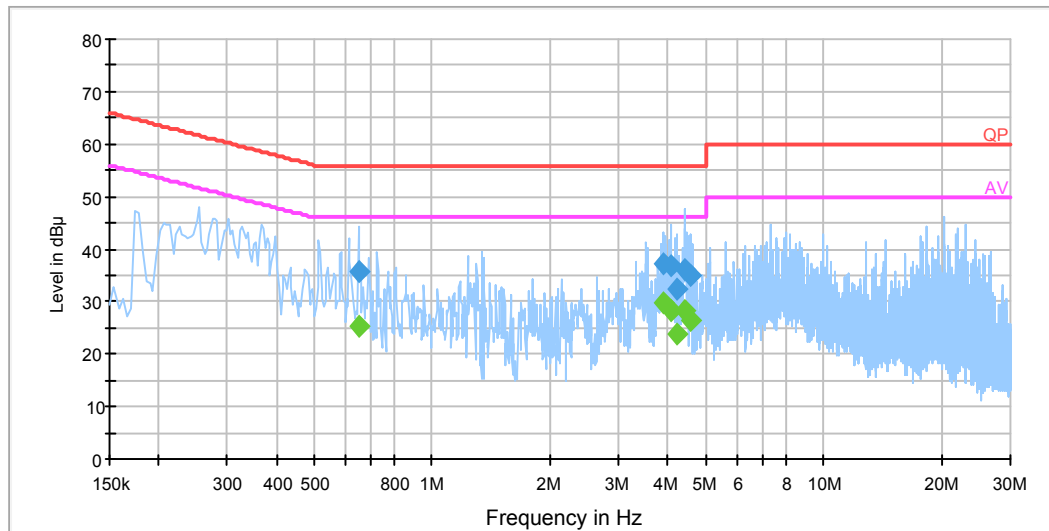
EMI Auto Test L



| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 18.918000       | 48.5                       | 20.0                   | 60.0         | 11.5        | QP                    |
| 20.258000       | 52.7                       | 20.0                   | 60.0         | 7.3         | QP                    |
| 22.458000       | 49.6                       | 20.1                   | 60.0         | 10.4        | QP                    |
| 23.126000       | 52.9                       | 20.1                   | 60.0         | 7.1         | QP                    |
| 24.350000       | 50.6                       | 20.2                   | 60.0         | 9.4         | QP                    |
| 26.610000       | 50.4                       | 20.3                   | 60.0         | 9.6         | QP                    |
| 18.918000       | 40.1                       | 20.0                   | 50.0         | 9.9         | Ave.                  |
| 20.258000       | 46.5                       | 20.0                   | 50.0         | 3.5         | Ave.                  |
| 22.458000       | 45.2                       | 20.1                   | 50.0         | 4.8         | Ave.                  |
| 23.126000       | 49.2                       | 20.1                   | 50.0         | 0.8*        | Ave.                  |
| 24.350000       | 46.3                       | 20.2                   | 50.0         | 3.7         | Ave.                  |
| 26.610000       | 45.9                       | 20.3                   | 50.0         | 4.1         | Ave.                  |

**AC 230V/50 Hz, Neutral:**

## EMI Auto Test N

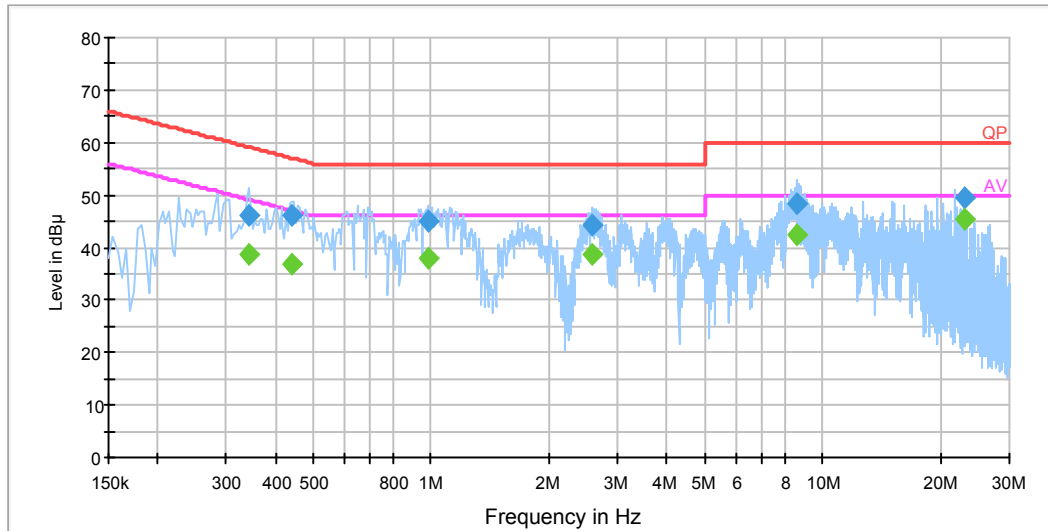


| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.650000        | 35.6                       | 19.5                   | 56.0         | 20.4        | QP                    |
| 3.906000        | 37.1                       | 19.6                   | 56.0         | 18.9        | QP                    |
| 4.070000        | 36.7                       | 19.7                   | 56.0         | 19.3        | QP                    |
| 4.230000        | 32.3                       | 19.7                   | 56.0         | 23.7        | QP                    |
| 4.438000        | 36.0                       | 19.7                   | 56.0         | 20.0        | QP                    |
| 4.570000        | 35.1                       | 19.7                   | 56.0         | 20.9        | QP                    |
| 0.650000        | 25.2                       | 19.5                   | 46.0         | 20.8        | Ave.                  |
| 3.906000        | 29.6                       | 19.6                   | 46.0         | 16.4        | Ave.                  |
| 4.070000        | 28.2                       | 19.7                   | 46.0         | 17.8        | Ave.                  |
| 4.230000        | 23.7                       | 19.7                   | 46.0         | 22.3        | Ave.                  |
| 4.438000        | 28.4                       | 19.7                   | 46.0         | 17.6        | Ave.                  |
| 4.570000        | 26.3                       | 19.7                   | 46.0         | 19.7        | Ave.                  |

## 3) Adapter 3 power supply:

**AC 230V/50 Hz, Line:**

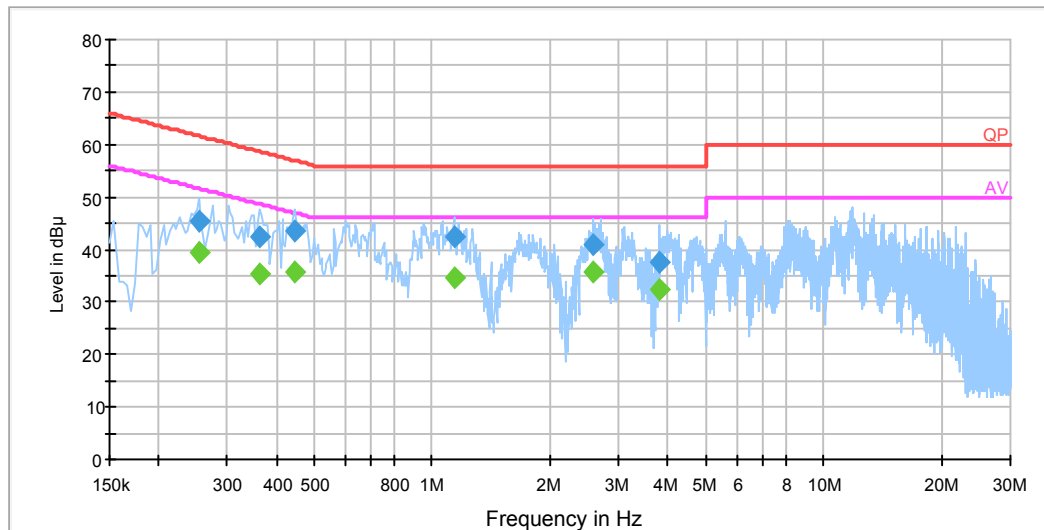
EMI Auto Test L



| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.342000        | 46.2                       | 19.5                   | 59.2         | 13.0        | QP                    |
| 0.442000        | 46.0                       | 19.5                   | 57.0         | 11.0        | QP                    |
| 0.986000        | 45.1                       | 19.5                   | 56.0         | 10.9        | QP                    |
| 2.574000        | 44.4                       | 19.5                   | 56.0         | 11.6        | QP                    |
| 8.578000        | 48.3                       | 19.7                   | 60.0         | 11.7        | QP                    |
| 23.130000       | 49.5                       | 20.1                   | 60.0         | 10.5        | QP                    |
| 0.342000        | 38.6                       | 19.5                   | 49.2         | 10.5        | Ave.                  |
| 0.442000        | 36.8                       | 19.5                   | 47.0         | 10.2        | Ave.                  |
| 0.986000        | 37.9                       | 19.5                   | 46.0         | 8.1         | Ave.                  |
| 2.574000        | 38.9                       | 19.5                   | 46.0         | 7.1         | Ave.                  |
| 8.578000        | 42.4                       | 19.7                   | 50.0         | 7.6         | Ave.                  |
| 23.130000       | 45.3                       | 20.1                   | 50.0         | 4.7         | Ave.                  |

**AC 230V/50 Hz, Neutral:**

## EMI Auto Test N

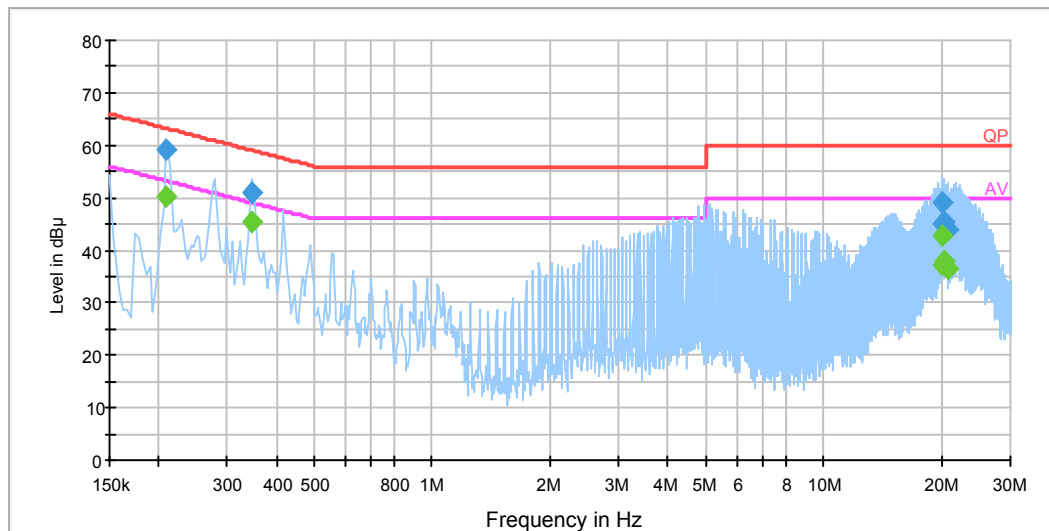


| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.254000        | 45.5                       | 19.5                   | 61.6         | 16.1        | QP                    |
| 0.362000        | 42.6                       | 19.5                   | 58.7         | 16.1        | QP                    |
| 0.446000        | 43.6                       | 19.5                   | 56.9         | 13.3        | QP                    |
| 1.138000        | 42.6                       | 19.5                   | 56.0         | 13.4        | QP                    |
| 2.574000        | 41.0                       | 19.6                   | 56.0         | 15.0        | QP                    |
| 3.818000        | 37.8                       | 19.6                   | 56.0         | 18.2        | QP                    |
| 0.254000        | 39.5                       | 19.5                   | 51.6         | 12.1        | Ave.                  |
| 0.362000        | 35.5                       | 19.5                   | 48.7         | 13.2        | Ave.                  |
| 0.446000        | 35.6                       | 19.5                   | 46.9         | 11.3        | Ave.                  |
| 1.138000        | 34.6                       | 19.5                   | 46.0         | 11.4        | Ave.                  |
| 2.574000        | 35.8                       | 19.6                   | 46.0         | 10.2        | Ave.                  |
| 3.818000        | 32.4                       | 19.6                   | 46.0         | 13.6        | Ave.                  |

## 4) PoE power supply:

**AC 230V/50 Hz, Line:**

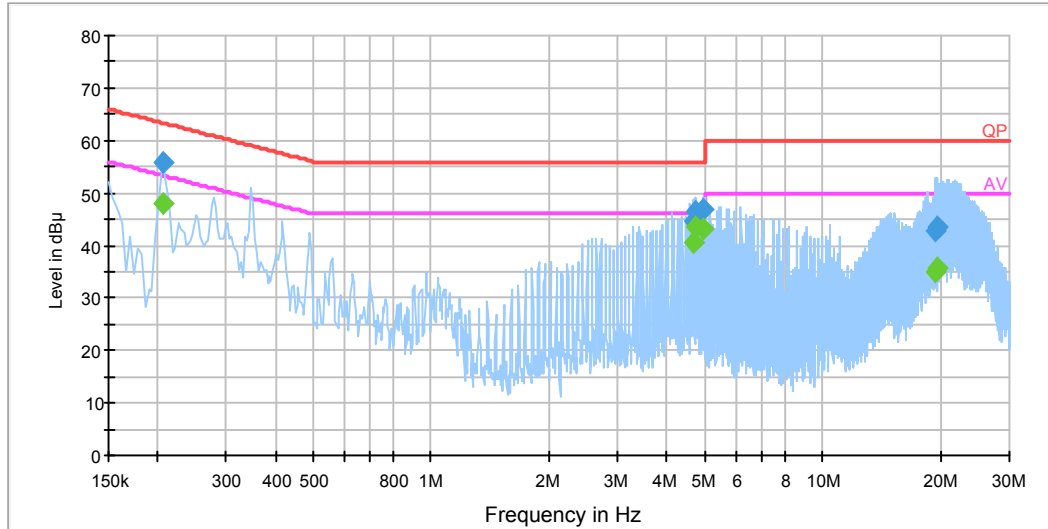
EMI Auto Test L



| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.210000        | 59.1                       | 19.5                   | 63.2         | 4.1         | QP                    |
| 0.346000        | 51.1                       | 19.5                   | 59.1         | 8.0         | QP                    |
| 20.034000       | 49.1                       | 20.0                   | 60.0         | 10.9        | QP                    |
| 20.182000       | 45.2                       | 20.0                   | 60.0         | 14.8        | QP                    |
| 20.318000       | 45.4                       | 20.0                   | 60.0         | 14.6        | QP                    |
| 20.806000       | 43.8                       | 20.0                   | 60.0         | 16.2        | QP                    |
| 0.210000        | 50.1                       | 19.5                   | 53.2         | 3.1*        | Ave.                  |
| 0.346000        | 45.4                       | 19.5                   | 49.1         | 3.6         | Ave.                  |
| 20.034000       | 42.8                       | 20.0                   | 50.0         | 7.2         | Ave.                  |
| 20.182000       | 37.1                       | 20.0                   | 50.0         | 12.9        | Ave.                  |
| 20.318000       | 37.9                       | 20.0                   | 50.0         | 12.1        | Ave.                  |
| 20.806000       | 36.3                       | 20.0                   | 50.0         | 13.7        | Ave.                  |

**AC 230V/50 Hz, Neutral:**

## EMI Auto Test N

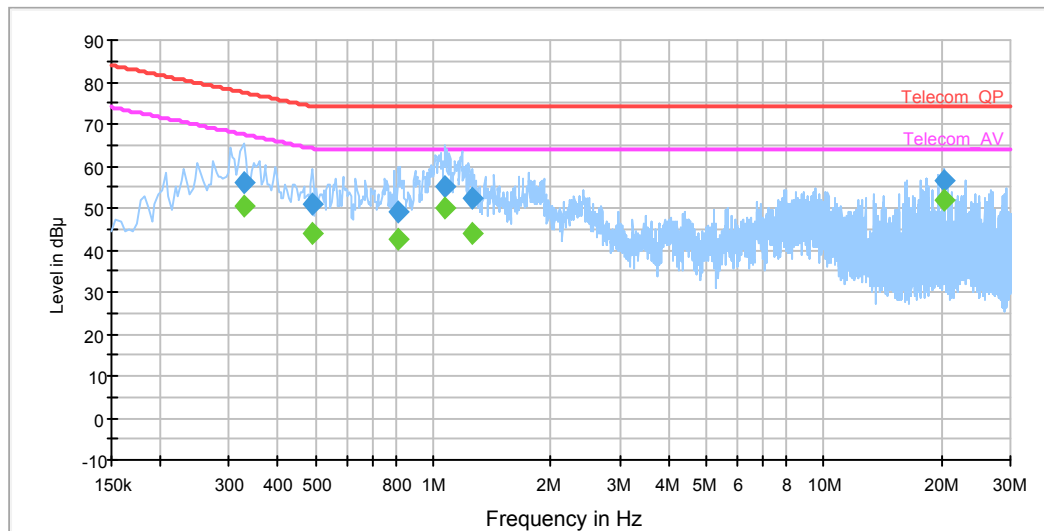


| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.206000        | 55.8                       | 19.5                   | 63.4         | 7.6         | QP                    |
| 4.670000        | 44.7                       | 19.7                   | 56.0         | 11.3        | QP                    |
| 4.738000        | 46.6                       | 19.7                   | 56.0         | 9.4         | QP                    |
| 4.946000        | 47.0                       | 19.7                   | 56.0         | 9.0         | QP                    |
| 19.510000       | 42.8                       | 20.1                   | 60.0         | 17.2        | QP                    |
| 19.718000       | 43.4                       | 20.1                   | 60.0         | 16.6        | QP                    |
| 0.206000        | 47.9                       | 19.5                   | 53.4         | 5.5         | Ave.                  |
| 4.670000        | 40.5                       | 19.7                   | 46.0         | 5.5         | Ave.                  |
| 4.738000        | 43.5                       | 19.7                   | 46.0         | 2.5*        | Ave.                  |
| 4.946000        | 43.0                       | 19.7                   | 46.0         | 3.0*        | Ave.                  |
| 19.510000       | 34.9                       | 20.1                   | 50.0         | 15.1        | Ave.                  |
| 19.718000       | 35.8                       | 20.1                   | 50.0         | 14.2        | Ave.                  |

## 5) Telecommunication Port:

**RJ45 Port:**

## CAT 5 Auto Test



| Frequency (MHz) | Corrected Amplitude (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------|------------------------|--------------|-------------|-----------------------|
| 0.326000        | 55.9                       | 19.8                   | 77.6         | 21.6        | QP                    |
| 0.490000        | 50.8                       | 19.6                   | 74.2         | 23.4        | QP                    |
| 0.814000        | 49.2                       | 19.6                   | 74.0         | 24.8        | QP                    |
| 1.070000        | 55.3                       | 19.6                   | 74.0         | 18.7        | QP                    |
| 1.262000        | 52.4                       | 19.6                   | 74.0         | 21.6        | QP                    |
| 20.258000       | 56.6                       | 19.6                   | 74.0         | 17.4        | QP                    |
| 0.326000        | 50.5                       | 19.8                   | 67.6         | 17.0        | Ave.                  |
| 0.490000        | 44.1                       | 19.6                   | 64.2         | 20.0        | Ave.                  |
| 0.814000        | 42.7                       | 19.6                   | 64.0         | 21.3        | Ave.                  |
| 1.070000        | 50.2                       | 19.6                   | 64.0         | 13.8        | Ave.                  |
| 1.262000        | 44.1                       | 19.6                   | 64.0         | 19.9        | Ave.                  |
| 20.258000       | 52.0                       | 19.6                   | 64.0         | 12.0        | Ave.                  |

**Note:**

- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation  
The corrected factor has been input into the transducer of the test software.
- 3) Margin = Limit – Corrected Amplitude
- 4) \*within measurement uncertainty!

## EN 55022 §6-RADIATED DISTURBANCE

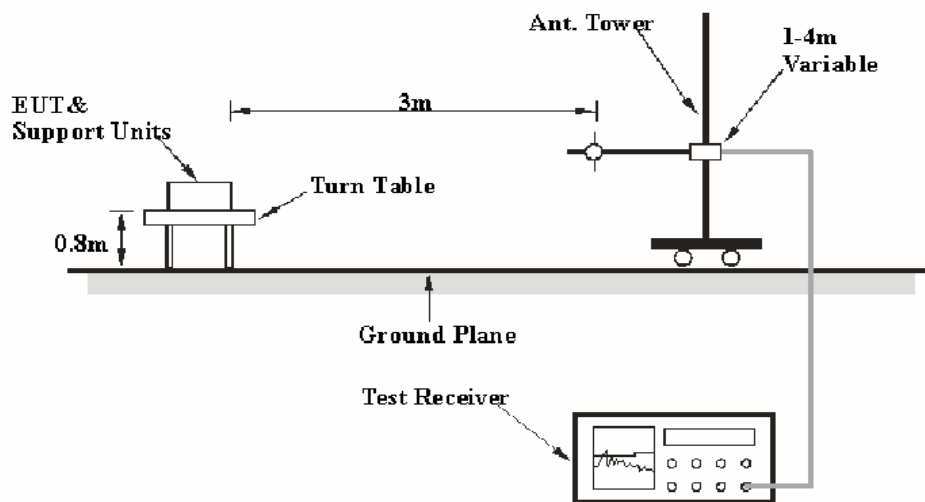
### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

| Frequency    | Polarity              | Measurement uncertainty                |
|--------------|-----------------------|----------------------------------------|
| 30MHz~200MHz | Horizontal            | 4.62 dB (k=2, 95% level of confidence) |
|              | Vertical              | 4.54 dB (k=2, 95% level of confidence) |
| 200MHz~1GHz  | Horizontal            | 4.84 dB (k=2, 95% level of confidence) |
|              | Vertical              | 5.91 dB (k=2, 95% level of confidence) |
| 1 GHz~6 GHz  | Horizontal / Vertical | 4.68 dB (k=2, 95% level of confidence) |
| Above 6 GHz  | Horizontal / Vertical | 4.92 dB (k=2, 95% level of confidence) |

### Test System Setup



The radiated emission tests were performed in the 3 meters chamber A test site, using the setup accordance with the CISPR16-1-4:2012, CISPR 16-2-3:2010. The specification used was EN 55022 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter and PoE adapter were connected to a 230 VAC/50 Hz power source.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 2 GHz.

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

| Frequency Range   | RBW     | Video B/W | IF B/W  | Detector |
|-------------------|---------|-----------|---------|----------|
| 30 MHz – 1000 MHz | 100 kHz | 300 kHz   | 120 kHz | QP       |
| Above 1 GHz       | 1 MHz   | 3 MHz     | /       | PK       |
|                   | 1 MHz   | 10 Hz     | /       | Ave.     |

### Test Equipment List and Details

| Manufacturer    | Description        | Model    | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------|----------|---------------|------------------|----------------------|
| HP              | Amplifier          | 8447E    | 1937A01046    | 2012-11-24       | 2013-11-23           |
| Rohde & Schwarz | EMI Test Receiver  | ESCI     | 101122        | 2013-05-09       | 2014-05-09           |
| Sunol Sciences  | Broadband Antenna  | JB1      | A040904-2     | 2011-11-28       | 2014-11-27           |
| Mini-Circuits   | Amplifier          | ZVA-213+ | N/A           | 2012-11-24       | 2013-11-23           |
| Sunol Sciences  | Horn Antenna       | DRH-118  | A052304       | 2011-12-01       | 2014-11-30           |
| Rohde & Schwarz | Signal Analyzer    | FSIQ26   | 8386001028    | 2012-11-24       | 2013-11-23           |
| R&S             | Auto test Software | EMC32    | V6.30         | -                | -                    |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

During the radiated emissions, the adapters were connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode from 30 MHz to 1 GHz, peak and average detection modes for frequencies above 1 GHz.

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude.}$$

### Test Results Summary

According to the data in the following table, with the worst margin reading of:

**3.0 dB at 62.236250 MHz in the Vertical polarization (adapter 1 power supply)**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

inBACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

### Test Data

#### Environmental Conditions

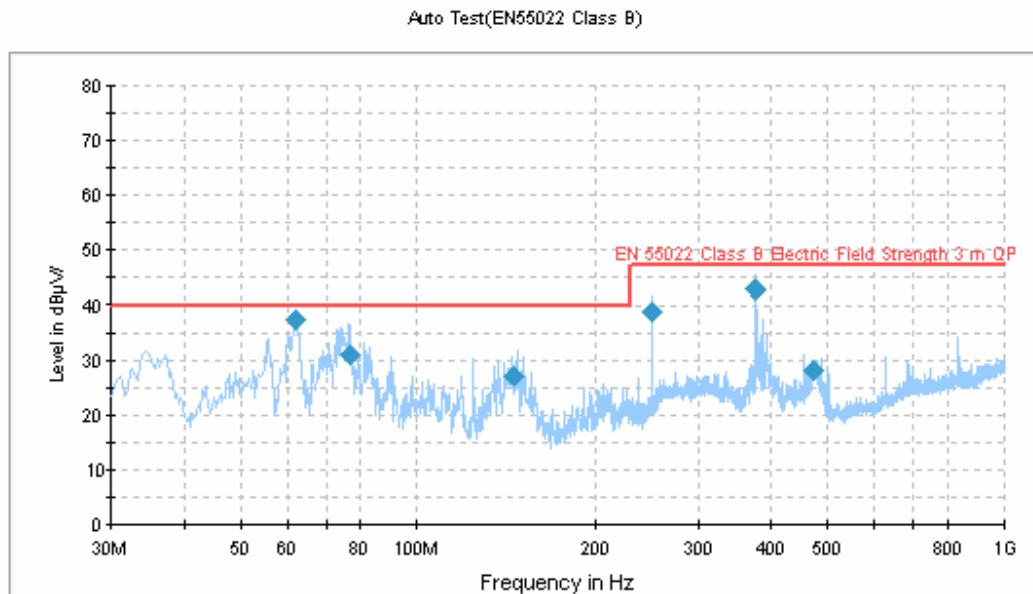
|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25 °C     |
| <b>Relative Humidity:</b> | 56 %      |
| <b>ATM Pressure:</b>      | 100.0 kPa |

*The testing was performed by Joson Xiao on 2013-06-25.*

*Test Mode: Talking*

## 1) Adapter 1 power supply:

Below 1 GHz:



| Frequency (MHz) | Corrected Amplitude (dBμV/m) | Antenna height (cm) | Antenna Polarity | Turntable position (degree) | Correction Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|------------------------------|---------------------|------------------|-----------------------------|--------------------------|----------------|-------------|
| 62.236250       | 37.0                         | 100.0               | V                | 60.0                        | -18.6                    | 40.0           | 3.0*        |
| 375.018500      | 43.0                         | 101.0               | H                | 345.0                       | -10.5                    | 47.0           | 4.0         |
| 250.235600      | 38.8                         | 201.0               | V                | 261.0                       | -1.2                     | 47.0           | 8.2         |
| 77.190500       | 31.2                         | 100.0               | V                | 105.0                       | -18.2                    | 40.0           | 8.8         |
| 473.580000      | 28.0                         | 174.0               | V                | 136.0                       | -0.9                     | 47.0           | 19.0        |
| 144.945000      | 27.3                         | 184.0               | V                | 179.0                       | -1.0                     | 47.0           | 19.7        |

\*within measurement uncertainty!

Above 1 GHz:

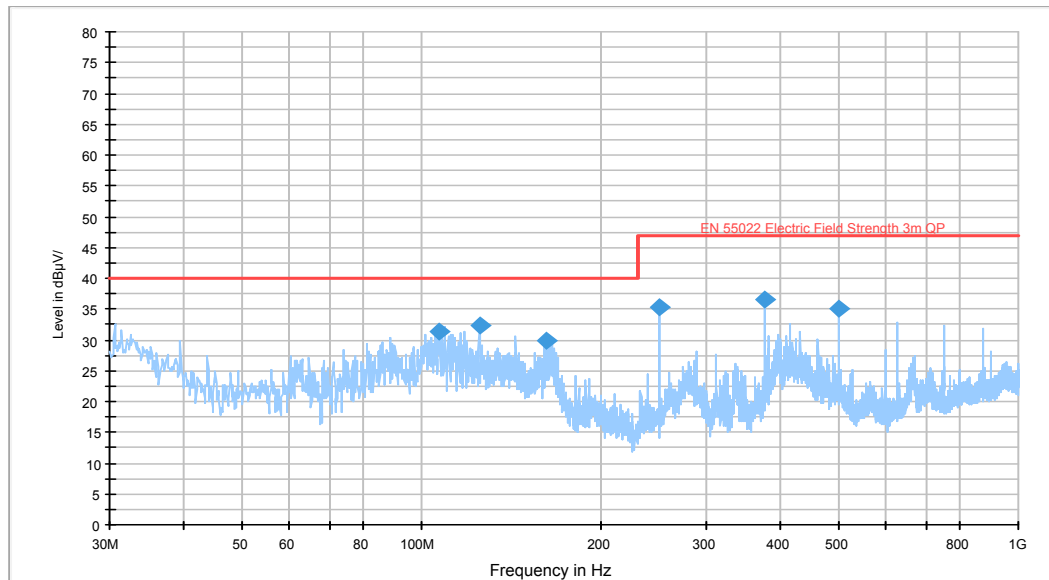
| Frequency (MHz) | S.A Reading (dBμV/m) | Detector (PK /Ave.) | Direction Degree | Antenna Height (m) | Polarity (H/V) | Antenna Factor (dB/m) | Cable loss (dB) | Amplifier Gain (dB) | Corrected Amplitude (dBμV/m) | EN55022        |             |
|-----------------|----------------------|---------------------|------------------|--------------------|----------------|-----------------------|-----------------|---------------------|------------------------------|----------------|-------------|
|                 |                      |                     |                  |                    |                |                       |                 |                     |                              | Limit (dBμV/m) | Margin (dB) |
| 1062.5          | 31.61                | Ave.                | 330              | 1.0                | V              | 26.85                 | 1.75            | 23.80               | 36.41                        | 50             | 13.59       |
| 1062.5          | 45.34                | PK                  | 330              | 1.0                | V              | 26.85                 | 1.75            | 23.80               | 50.14                        | 70             | 19.86       |
| 1366.4          | 46.35                | PK                  | 330              | 1.0                | H              | 26.83                 | 1.97            | 26.70               | 48.45                        | 70             | 21.55       |
| 1366.4          | 25.59                | Ave.                | 330              | 1.0                | H              | 26.83                 | 1.97            | 26.70               | 27.69                        | 50             | 22.31       |

Note: The data which below 20 dB to the limit was not recorded.

## 2) Adapter 2 power supply:

Below 1 GHz:

EN55022



| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna height (cm) | Antenna Polarity | Turntable position (degree) | Correction Factor (dB/m) | Limit (dBµV/m) | Margin (dB) |
|-----------------|------------------------------|---------------------|------------------|-----------------------------|--------------------------|----------------|-------------|
| 106.751250      | 31.4                         | 117.0               | H                | 131.0                       | -15.5                    | 40.0           | 8.6         |
| 124.976700      | 32.4                         | 100.0               | V                | 112.0                       | -13.4                    | 40.0           | 7.6         |
| 162.457000      | 29.8                         | 121.0               | V                | 126.0                       | -15.2                    | 40.0           | 10.2        |
| 249.947000      | 35.3                         | 109.0               | V                | 117.0                       | -15.8                    | 47.0           | 11.7        |
| 375.017000      | 36.6                         | 112.0               | H                | 149.0                       | -12.9                    | 47.0           | 10.4        |
| 500.086000      | 35.1                         | 126.0               | H                | 138.0                       | -10.1                    | 47.0           | 11.9        |

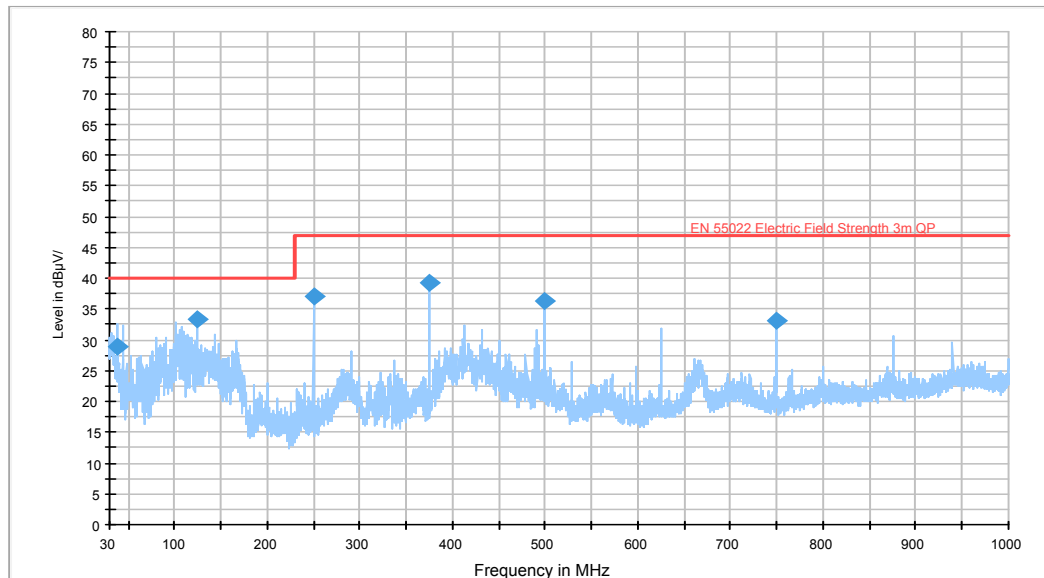
Above 1 GHz:

| Frequency (MHz) | Receiver       |                       | Turntable Degree | Rx Antenna |             | Correction Factor (dB/m) | Corrected Amplitude (dBµV/m) | EN 55022       |             |
|-----------------|----------------|-----------------------|------------------|------------|-------------|--------------------------|------------------------------|----------------|-------------|
|                 | Reading (dBµV) | Detector (PK/QP/Ave.) |                  | Height (m) | Polar (H/V) |                          |                              | Limit (dBµV/m) | Margin (dB) |
| 1306.6          | 50.27          | PK                    | 151              | 1.3        | H           | 0.19                     | 50.46                        | 70             | 19.54       |
| 1306.6          | 33.54          | Ave.                  | 151              | 1.3        | H           | 0.19                     | 33.73                        | 50             | 16.27       |
| 1641.2          | 55.66          | PK                    | 184              | 1.5        | H           | 1.77                     | 57.43                        | 70             | 12.57       |
| 1641.2          | 37.83          | Ave.                  | 184              | 1.5        | H           | 1.77                     | 39.60                        | 50             | 10.40       |
| 1306.6          | 56.56          | PK                    | 305              | 1.5        | V           | 0.19                     | 56.75                        | 70             | 13.25       |
| 1306.6          | 36.40          | Ave.                  | 305              | 1.5        | V           | 0.19                     | 36.59                        | 50             | 13.41       |
| 1641.2          | 54.21          | PK                    | 196              | 1.4        | V           | 1.77                     | 55.98                        | 70             | 14.02       |
| 1641.2          | 35.02          | Ave.                  | 196              | 1.4        | V           | 1.77                     | 36.79                        | 50             | 13.21       |

## 3) Adapter 3 power supply:

Below 1 GHz:

EN55022



| Frequency (MHz) | Corrected Amplitude (dBμV/m) | Antenna height (cm) | Antenna Polarity | Turntable position (degree) | Correction Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|------------------------------|---------------------|------------------|-----------------------------|--------------------------|----------------|-------------|
| 37.861050       | 29.0                         | 100.0               | V                | 224.0                       | -12.8                    | 40.0           | 11.0        |
| 124.758000      | 33.2                         | 116.0               | H                | 146.0                       | -13.4                    | 40.0           | 6.8         |
| 250.124800      | 37.2                         | 102.0               | V                | 221.0                       | -15.8                    | 47.0           | 9.8         |
| 375.124870      | 39.2                         | 108.0               | V                | 216.0                       | -12.9                    | 47.0           | 7.8         |
| 499.678540      | 36.3                         | 119.0               | V                | 174.0                       | -10.1                    | 47.0           | 10.7        |
| 750.127400      | 33.2                         | 127.0               | H                | 209.0                       | -6.6                     | 47.0           | 13.8        |

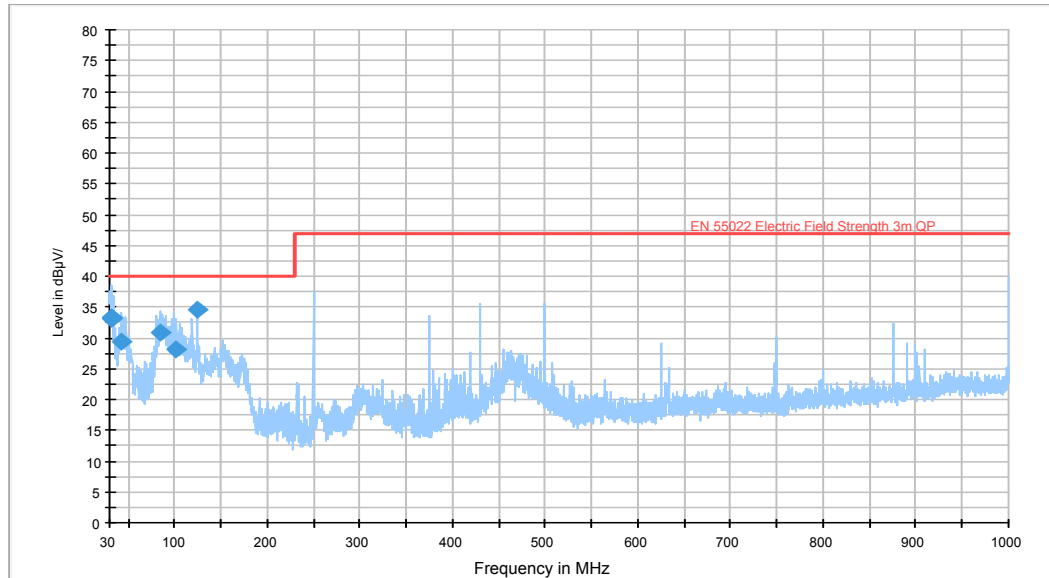
Above 1 GHz:

| Frequency (MHz) | Receiver       |                       | Turntable Degree | Rx Antenna |             | Correction Factor (dB/m) | Corrected Amplitude (dBμV/m) | EN 55022       |             |
|-----------------|----------------|-----------------------|------------------|------------|-------------|--------------------------|------------------------------|----------------|-------------|
|                 | Reading (dBμV) | Detector (PK/QP/Ave.) |                  | Height (m) | Polar (H/V) |                          |                              | Limit (dBμV/m) | Margin (dB) |
| 1490.9          | 44.23          | PK                    | 333              | 1.2        | H           | 1.15                     | 45.38                        | 70             | 24.62       |
| 1490.9          | 35.59          | Ave.                  | 333              | 1.2        | H           | 1.15                     | 36.74                        | 50             | 13.26       |
| 1874.2          | 45.71          | PK                    | 53               | 1.3        | H           | 2.63                     | 48.34                        | 70             | 21.66       |
| 1874.2          | 34.31          | Ave.                  | 53               | 1.3        | H           | 2.63                     | 36.94                        | 50             | 13.06       |
| 1490.9          | 46.58          | PK                    | 19               | 1.4        | V           | 1.15                     | 47.73                        | 70             | 22.27       |
| 1490.9          | 36.12          | Ave.                  | 19               | 1.4        | V           | 1.15                     | 37.27                        | 50             | 12.73       |
| 1874.2          | 43.28          | PK                    | 64               | 1.2        | V           | 2.63                     | 45.91                        | 70             | 24.09       |
| 1874.2          | 34.28          | Ave.                  | 64               | 1.2        | V           | 2.63                     | 36.91                        | 50             | 13.09       |

## 3) PoE power supply:

Below 1 GHz:

EN55022



| Frequency (MHz) | Corrected Amplitude (dBμV/m) | Antenna height (cm) | Antenna Polarity | Turntable position (degree) | Correction Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|------------------------------|---------------------|------------------|-----------------------------|--------------------------|----------------|-------------|
| 32.566000       | 33.4                         | 99.0                | V                | 74.0                        | -8.8                     | 40.0           | 6.6         |
| 32.566000       | 33.1                         | 99.0                | V                | 69.0                        | -8.8                     | 40.0           | 6.9         |
| 43.431550       | 29.4                         | 99.0                | V                | 15.0                        | -16.8                    | 40.0           | 10.6        |
| 85.502450       | 30.9                         | 125.0               | V                | 0.0                         | -20.3                    | 40.0           | 9.1         |
| 102.504650      | 28.2                         | 99.0                | V                | 104.0                       | -16.6                    | 40.0           | 11.8        |
| 125.011500      | 34.5                         | 112.0               | V                | 145.0                       | -13.4                    | 40.0           | 5.5         |

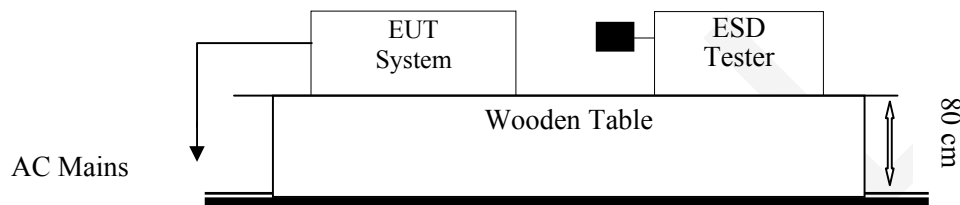
Above 1 GHz:

| Frequency (MHz) | Receiver       |                       | Turntable Degree | Rx Antenna |             | Correction Factor (dB/m) | Corrected Amplitude (dBμV/m) | EN 55022       |             |
|-----------------|----------------|-----------------------|------------------|------------|-------------|--------------------------|------------------------------|----------------|-------------|
|                 | Reading (dBμV) | Detector (PK/QP/Ave.) |                  | Height (m) | Polar (H/V) |                          |                              | Limit (dBμV/m) | Margin (dB) |
| 1430.8          | 56.93          | PK                    | 259              | 1.4        | H           | 0.74                     | 57.67                        | 70             | 12.33       |
| 1430.8          | 36.24          | Ave.                  | 259              | 1.4        | H           | 0.74                     | 36.98                        | 50             | 13.02       |
| 1651.3          | 58.06          | PK                    | 304              | 1.3        | H           | 1.77                     | 59.83                        | 70             | 10.17       |
| 1651.3          | 37.56          | Ave.                  | 304              | 1.3        | H           | 1.77                     | 39.33                        | 50             | 10.67       |
| 1430.8          | 53.48          | PK                    | 331              | 1.2        | V           | 0.74                     | 54.22                        | 70             | 15.78       |
| 1430.8          | 35.41          | Ave.                  | 331              | 1.2        | V           | 0.74                     | 36.15                        | 50             | 13.85       |
| 1651.3          | 55.62          | PK                    | 30               | 1.4        | V           | 1.77                     | 57.39                        | 70             | 12.61       |
| 1651.3          | 35.34          | Ave.                  | 30               | 1.4        | V           | 1.77                     | 37.11                        | 50             | 12.89       |

**EN 55024 §4.2.1-ELECTROSTATIC DISCHARGES (IEC 61000-4-2)****Test Equipment**

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------|-------|---------------|------------------|----------------------|
| EM Test      | ESD Tester  | Dito  | 302105        | 2010-10-27       | 2011-10-26           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**

Remark: ■ is the tip of the electrode

IEC 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.5 by 1.0-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

**Test Standard**

EN 55024:2010 (IEC 61000-4-2:2008)

Test level 3 for Air Discharge at  $\pm 8$  kV

Test level 2 for Contact Discharge at  $\pm 4$  kV

**Test Level**

| Level | Test Voltage<br>Contact Discharge ( $\pm$ kV) | Test Voltage<br>Air Discharge ( $\pm$ kV) |
|-------|-----------------------------------------------|-------------------------------------------|
| 1.    | 2                                             | 2                                         |
| 2.    | 4                                             | 4                                         |
| 3.    | 6                                             | 8                                         |
| 4.    | 8                                             | 15                                        |
| X.    | Special                                       | Special                                   |

**Performance criterion: B**

## Test Procedure

### 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 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### Contact Discharge:

All the procedure shall be same as Section 8.3.1 of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### Indirect discharge for horizontal coupling plane

At least 20 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 0.1 m from the EUT and with the discharge electrode touching the coupling plane.

### Indirect discharge for vertical coupling plane

At least 20 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m × 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.

## Test Data and Setup Photo

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 25°C      |
| Relative Humidity: | 50 %      |
| ATM Pressure:      | 101.0 kPa |

*The testing was performed by Grace Xi on 2011-08-22.*

*Test Mode: Talking*

1) Adapter power supply:

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |        |        |
|------------------------------------|-------------|-------|-------|-------|-------|-------|--------|--------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| LCD (10 points)                    | A           | A     | A     | A     | A     | A     | /      | /      |
| Surface Crack (8 points)           | A           | A     | A     | A     | A     | A     | /      | /      |
| Key (49 points)                    | A           | A     | A     | A     | A     | A     | /      | /      |
| Speaker (5 points)                 | A           | A     | A     | A     | A     | A     | /      | /      |
| RJ11 Port (3 points)               | A           | A     | A     | A     | A     | A     | /      | /      |
| RJ45 Port (2 points)               | A           | A     | A     | A     | A     | A     | /      | /      |
| Microphone (1 point)               | A           | A     | A     | A     | A     | A     | /      | /      |

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| /                                  | /           | /     | /     | /     | /     | /     | /     | /     |

**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                         | A           | A     | A     | A     | /     | /     | /     | /     |
| Back Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Left Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Right Side                         | A           | A     | A     | A     | /     | /     | /     | /     |

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                         | A           | A     | A     | A     | /     | /     | /     | /     |
| Back Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Left Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Right Side                         | A           | A     | A     | A     | /     | /     | /     | /     |

### Air Discharge



### Indirect Contact



### Test Setup Photos

2) PoE power supply:

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |        |        |
|------------------------------------|-------------|-------|-------|-------|-------|-------|--------|--------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| LCD (10 points)                    | A           | A     | A     | A     | A     | A     | /      | /      |
| Surface Crack (8 points)           | A           | A     | A     | A     | A     | A     | /      | /      |
| Key (49 points)                    | A           | A     | A     | A     | A     | A     | /      | /      |
| Speaker (5 points)                 | A           | A     | A     | A     | A     | A     | /      | /      |
| RJ11 Port (3 points)               | A           | A     | A     | A     | A     | A     | /      | /      |
| RJ45 Port (2 points)               | A           | A     | A     | A     | A     | A     | /      | /      |
| Microphone (1 point)               | A           | A     | A     | A     | A     | A     | /      | /      |

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| /                                  | /           | /     | /     | /     | /     | /     | /     | /     |

**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                         | A           | A     | A     | A     | /     | /     | /     | /     |
| Back Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Left Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Right Side                         | A           | A     | A     | A     | /     | /     | /     | /     |

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

| IEC 61000-4-2 Test Points Location | Test Levels |       |       |       |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                                    | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                         | A           | A     | A     | A     | /     | /     | /     | /     |
| Back Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Left Side                          | A           | A     | A     | A     | /     | /     | /     | /     |
| Right Side                         | A           | A     | A     | A     | /     | /     | /     | /     |

### Air Discharge



### Indirect Contact

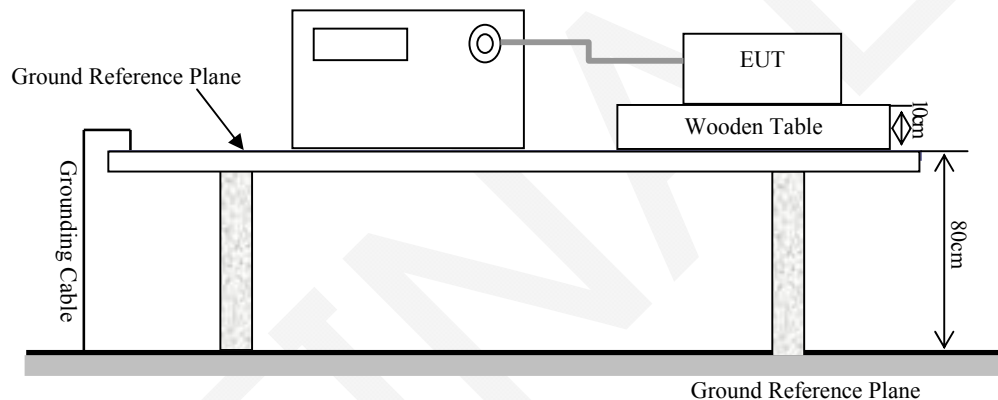


### Test Setup Photos

**EN 55024 §4.2.2-ELECTRICAL FAST TRANSIENTS (IEC 61000-4-4)****Test Equipment**

| Manufacturer | Description             | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|-----------|---------------|------------------|----------------------|
| EM Test      | Ultra Compact Generator | UCS500-N5 | V0939105172   | 2011-07-04       | 2012-07-03           |
| EM Test      | Auto-transformer        | MV2616    | V0939105173   | 2011-07-04       | 2012-07-03           |
| EM Test      | EFT Clamp               | N/A       | 300886        | 2011-07-04       | 2012-07-03           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup****Test Standard**

EN 55024:2010 (IEC 61000-4-4:2004)  
AC mains: Test level 2 at 1 kV  
Signal port: Test level 2 at 0.5 kV

**Test 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                                             |

**Performance Criterion: B**

## Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

## Test Data and Setup Photo

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25°C      |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

The testing was performed by Grace Xi on 2011-08-19.

.Test Mode: Talking

1) Adapter power supply:

| IEC 61000-4-4<br>Test Points     |             | Test Levels (kV) |      |      |      |      |      |      |      |
|----------------------------------|-------------|------------------|------|------|------|------|------|------|------|
|                                  |             | +0.5             | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| AC mains<br>power input<br>ports | L1          | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L2          | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | Earth       | /                | /    | /    | /    | /    | /    | /    | /    |
|                                  | L1+L2       | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L1 + Earth  | /                | /    | /    | /    | /    | /    | /    | /    |
|                                  | L2 + Earth  | /                | /    | /    | /    | /    | /    | /    | /    |
|                                  | L1+L2+Earth | /                | /    | /    | /    | /    | /    | /    | /    |
| Signal ports                     | RJ45        | A                | A    | /    | /    | /    | /    | /    | /    |

2) PoE power supply:

| IEC 61000-4-4<br>Test Points     |             | Test Levels (kV) |      |      |      |      |      |      |      |
|----------------------------------|-------------|------------------|------|------|------|------|------|------|------|
|                                  |             | +0.5             | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| AC mains<br>power input<br>ports | L1          | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L2          | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | Earth       | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L1+L2       | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L1 + Earth  | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L2 + Earth  | A                | A    | A    | A    | /    | /    | /    | /    |
|                                  | L1+L2+Earth | A                | A    | A    | A    | /    | /    | /    | /    |
| Signal ports                     | RJ45        | A                | A    | /    | /    | /    | /    | /    | /    |

1) Adapter power supply

AC Mains



RJ45 port



## AC Mains



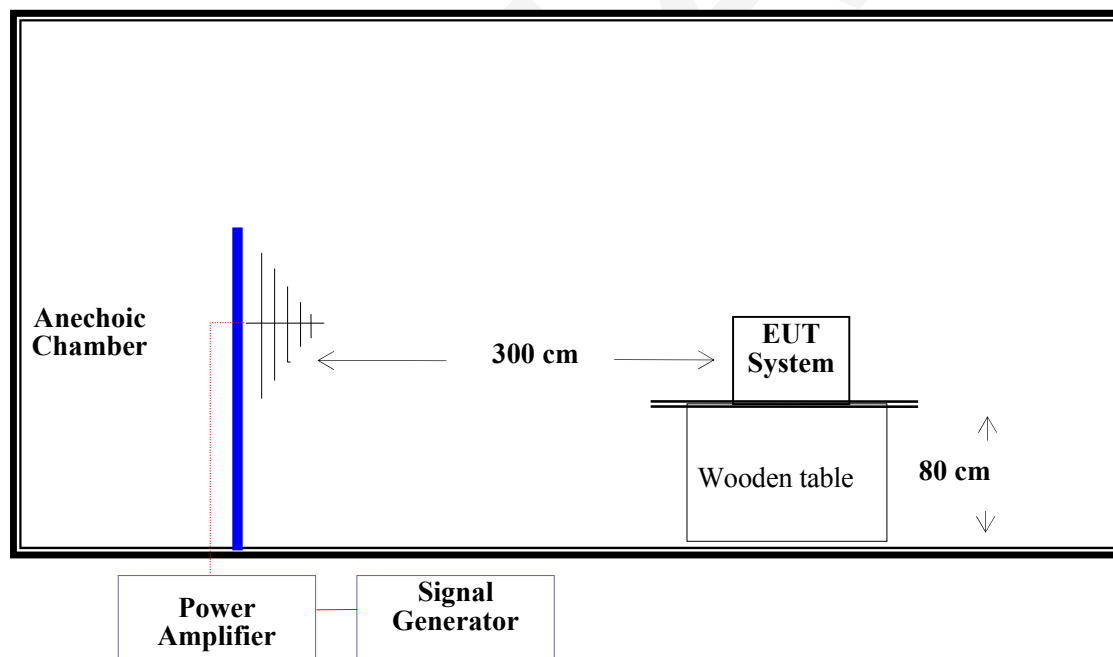
## A photograph of a laboratory setup for testing surge protection. On a table, there is a large grey metal enclosure, a smaller electronic device with a red display, and a black telephone. A yellow warning sign with a lightning bolt symbol and a sign reading "EFT/SURGE/ DIPS TEST" are on the wall.

EN 55022:2010, EN 55024:2010,  
EN 61000-3-2:2006 + A1:2009 + A2:2009 & EN 61000-3-3:2008

**EN 55024 §4.2.3.1-CONTINUOUS RADIATED DISTURBANCES (IEC 61000-4-3)****Test Equipment**

| Manufacturer       | Description       | Model       | Serial Number | Calibration Date | Calibration Due Date |
|--------------------|-------------------|-------------|---------------|------------------|----------------------|
| Amplifier Research | Amplifier         | 200W1000/M2 | 15893         | 2011-01-14       | 2012-01-14           |
| Amplifier Research | Field Meter       | FM5004      | 302149        | 2011-03-31       | 2012-03-30           |
| ETS-LINDGREN       | Sensor            | HI-6005     | N/A           | 2011-03-31       | 2012-03-30           |
| HP                 | Signal Generator  | HP8657A     | 2849U00982    | 2010-10-28       | 2011-10-27           |
| Amplifier Research | Biconilog Antenna | AT1080      | 301902        | N/A              | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**

**Test Standard**

EN 55024:2010 (IEC 61000-4-3: 2006 + A1:2007 + A2:2010)  
Test level 2 at 3V / m

**Test Level**

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

**Performance Criterion: A****Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter 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 polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera and Laptop, telephones are used to monitor the EUT and the sound pressure level.

All the scanning conditions are as follows:

| Condition of Test            | Remarks                  |
|------------------------------|--------------------------|
| 1. Field Strength            | 3 V/m (Test level 2)     |
| 2. Radiated Signal           | AM 80%, 1 kHz Modulation |
| 3. Scanning Frequency        | 80 – 1000 MHz            |
| 4. Sweeping time of radiated | 0.0015decade/s           |
| 5. Dwell Time                | 1Sec.                    |

**Test Data and Setup Photo****Environmental Conditions**

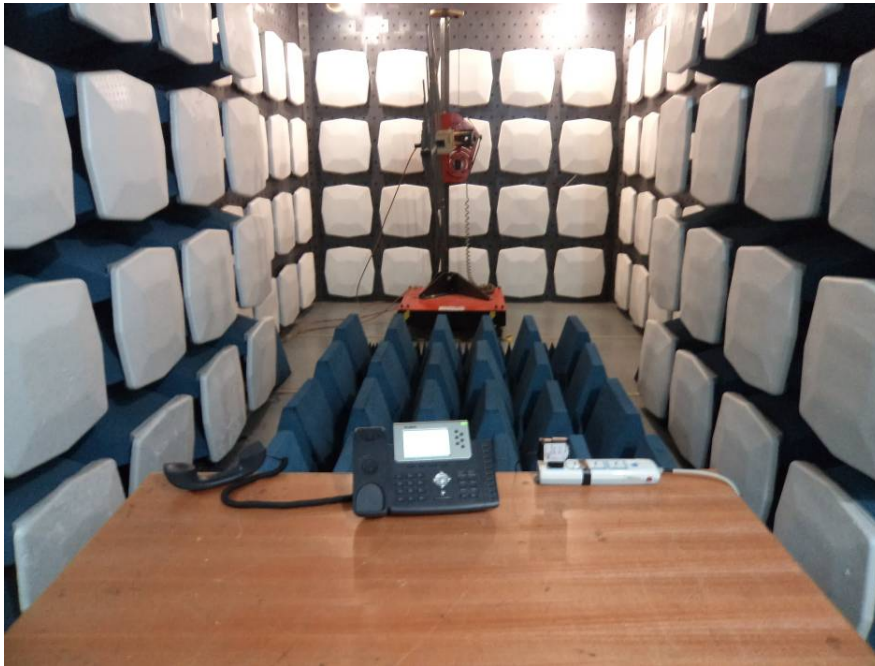
|                    |           |
|--------------------|-----------|
| Temperature:       | 25°C      |
| Relative Humidity: | 50 %      |
| ATM Pressure:      | 101.0 kPa |

The testing was performed by Grace Xi on 2011-08-15.

*Test Mode: Talking*

1) Adapter power supply:

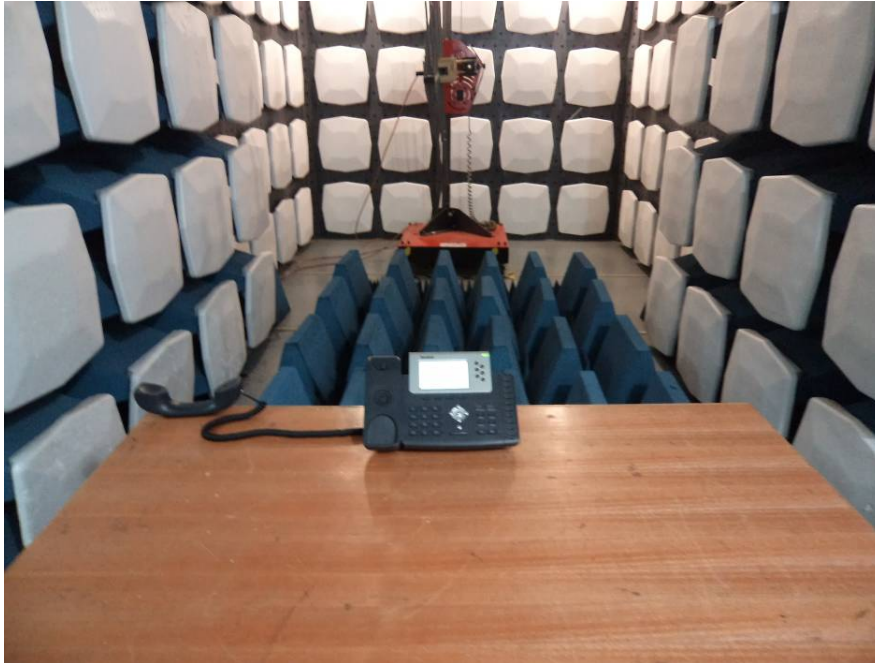
| Frequency Range (MHz) | Front Side (3 V/m) |      | Rear Side (3 V/m) |      | Left Side (3 V/m) |      | Right Side (3 V/m) |      |
|-----------------------|--------------------|------|-------------------|------|-------------------|------|--------------------|------|
|                       | VERT               | HORI | VERT              | HORI | VERT              | HORI | VERT               | HORI |
| 80-1000               | A                  | A    | A                 | A    | A                 | A    | A                  | A    |



**Test Setup Photo**

## 2) PoE power supply:

| Frequency Range (MHz) | Front Side (3 V/m) |      | Rear Side (3 V/m) |      | Left Side (3 V/m) |      | Right Side (3 V/m) |      |
|-----------------------|--------------------|------|-------------------|------|-------------------|------|--------------------|------|
|                       | VERT               | HORI | VERT              | HORI | VERT              | HORI | VERT               | HORI |
| 80-1000               | A                  | A    | A                 | A    | A                 | A    | A                  | A    |



Test Setup Photo

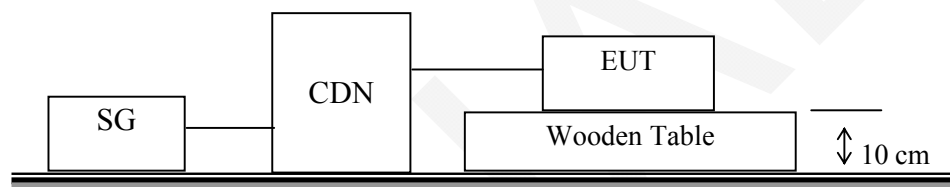
## EN 55024 §4.2.3.2-CONTINUOUS CONDUCTED DISTURBANCES (IEC 61000-4-6)

### Test Equipment

| Manufacturer | Description | Model  | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------|--------|---------------|------------------|----------------------|
| EM Test      | CDN         | M3     | 1201-05       | 2011-03-09       | 2012-03-08           |
| EM Test      | C/S Tester  | CWS500 | 303277        | 2010-11-03       | 2011-11-02           |
| EM Test      | Attenuator  | 6dB    | 303282        | 2010-11-15       | 2011-11-14           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Setup



### Test Standard

EN 55024:2010 (IEC 61000-4-6:2008)  
Test level 2 at 3 V (r.m.s.), 0.15 MHz ~ 80 MHz,

### Test Level

| Level | Voltage Level (r.m.s.) (V) |
|-------|----------------------------|
| 1     | 1                          |
| 2     | 3                          |
| 3     | 10                         |
| X     | Special                    |

**Performance Criterion: A**

## Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m 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).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  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.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## Test Data and Setup Photo

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25°C      |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

The testing was performed by Grace Xi on 2011-08-15.

Test Mode: Talking

- 1) Adapter power supply:

**Table 1: AC mains power input port**

**Modulation:** Amplitude 80%, 1 kHz sine wave

**Test level:** 3V r.m.s.

| Level | Voltage Level (r.m.s.)<br>$U_0$ | Pass | Fail |
|-------|---------------------------------|------|------|
| 1     | 1                               | /    | /    |
| 2     | 3                               | A    | /    |
| 3     | 10                              | /    | /    |
| X     | Special                         | /    | /    |

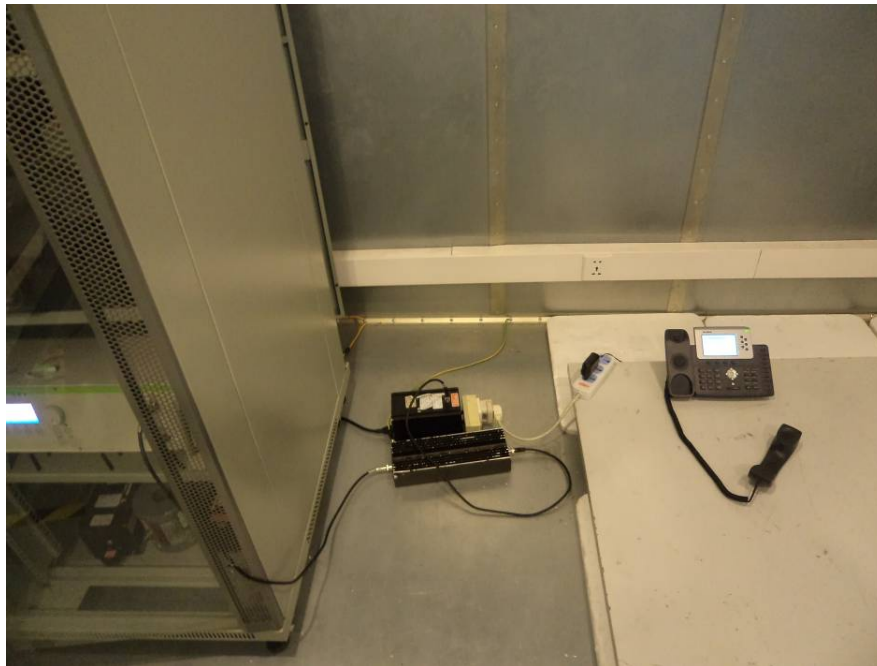
**Table 2: RJ45 port**

**Modulation:** Amplitude 80%, 1 kHz sine wave

**Test level:** 3V r.m.s.

| Level | Voltage Level (r.m.s.)<br>$U_0$ | Pass | Fail |
|-------|---------------------------------|------|------|
| 1     | 1                               | /    | /    |
| 2     | 3                               | A    | /    |
| 3     | 10                              | /    | /    |
| X     | Special                         | /    | /    |

### AC Mains



### RJ45 Port



### Test Setup Photos

2) PoE power supply:

**Table 1: AC mains power input port**

**Modulation:** Amplitude 80%, 1 kHz sine wave

**Test level:** 3V r.m.s.

| Level | Voltage Level (r.m.s.)<br>$U_0$ | Pass | Fail |
|-------|---------------------------------|------|------|
| 1     | 1                               | /    | /    |
| 2     | 3                               | A    | /    |
| 3     | 10                              | /    | /    |
| X     | Special                         | /    | /    |

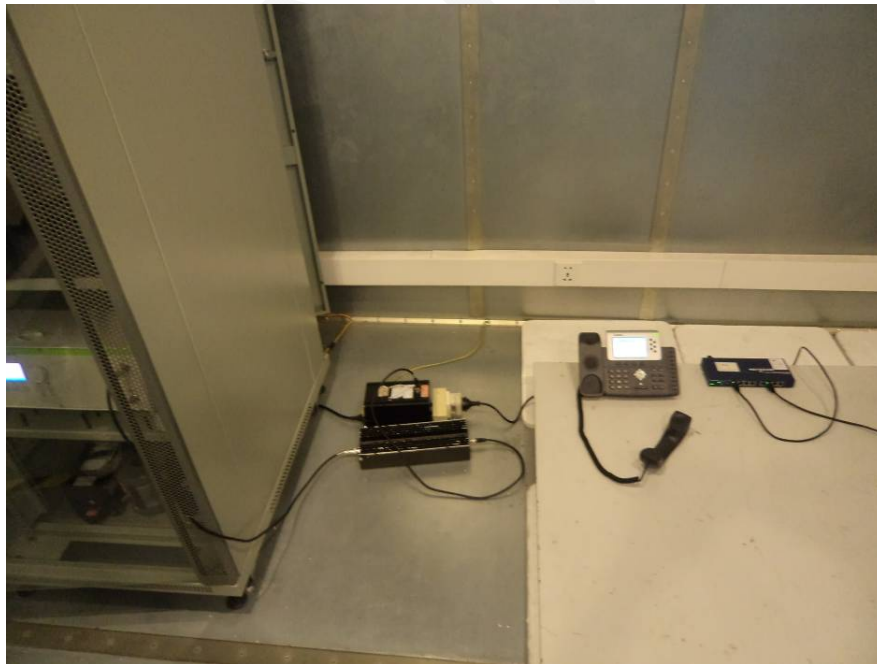
**Table 2: RJ45 port**

**Modulation:** Amplitude 80%, 1 kHz sine wave

**Test level:** 3V r.m.s.

| Level | Voltage Level (r.m.s.)<br>$U_0$ | Pass | Fail |
|-------|---------------------------------|------|------|
| 1     | 1                               | /    | /    |
| 2     | 3                               | A    | /    |
| 3     | 10                              | /    | /    |
| X     | Special                         | /    | /    |

### AC Mains

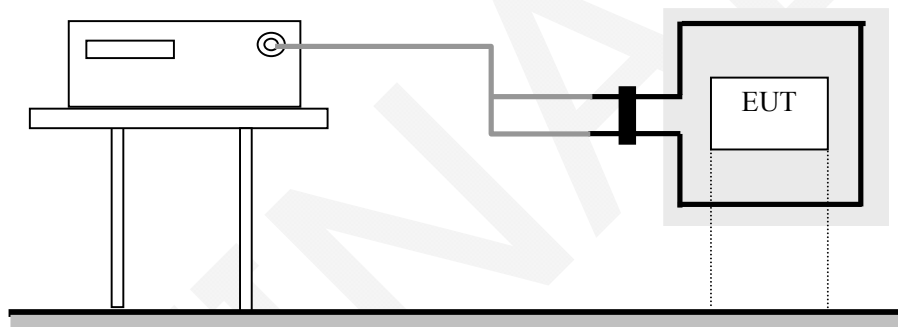


## Test Setup Photos

**EN 55024 §4.2.4-POWER FREQUENCY MAGNETIC FIELDS (IEC 61000-4-8)****Test Equipment**

| Manufacturer | Description             | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|-----------|---------------|------------------|----------------------|
| EM Test      | Ultra Compact Generator | UCS500-N5 | V0939105172   | 2011-07-04       | 2012-07-03           |
| EM Test      | Auto-transformer        | MV2616    | V0939105173   | 2011-07-04       | 2012-07-03           |
| EM Test      | Current Transformer     | MC2630    | 0309-59       | 2011-03-09       | 2012-03-08           |
| EM Test      | Loop Antenna            | MS100     | 0809-05       | 2011-03-09       | 2012-03-08           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test Setup****Test Standard**

EN 55024:2010 (IEC 61000-4-8:2009)  
Test level 1 at 1A/m

**Test Level**

| Level | Magnetic Field Strength A/m |
|-------|-----------------------------|
| 1     | 1                           |
| 2     | 3                           |
| 3     | 10                          |
| 4     | 30                          |
| 5     | 100                         |
| X.    | Special                     |

**Performance criterion: A**

## Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1 m\*1 m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

## Test Data and Setup Photo

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 25°C      |
| Relative Humidity: | 50 %      |
| ATM Pressure:      | 101.0 kPa |

The testing was performed by Grace Xi on 2011-08-19.

Test Mode: Talking

#### 1) Adapter power supply:

| Level | Magnetic Field Strength<br>A/m | X (Horizontal) | Y (Vertical) | Z (Special) |
|-------|--------------------------------|----------------|--------------|-------------|
| 1     | 1                              | A              | A            | A           |
| 2     | 3                              | /              | /            | /           |
| 3     | 10                             | /              | /            | /           |
| 4     | 30                             | /              | /            | /           |
| 5     | 100                            | /              | /            | /           |
| X     | Special                        | /              | /            | /           |

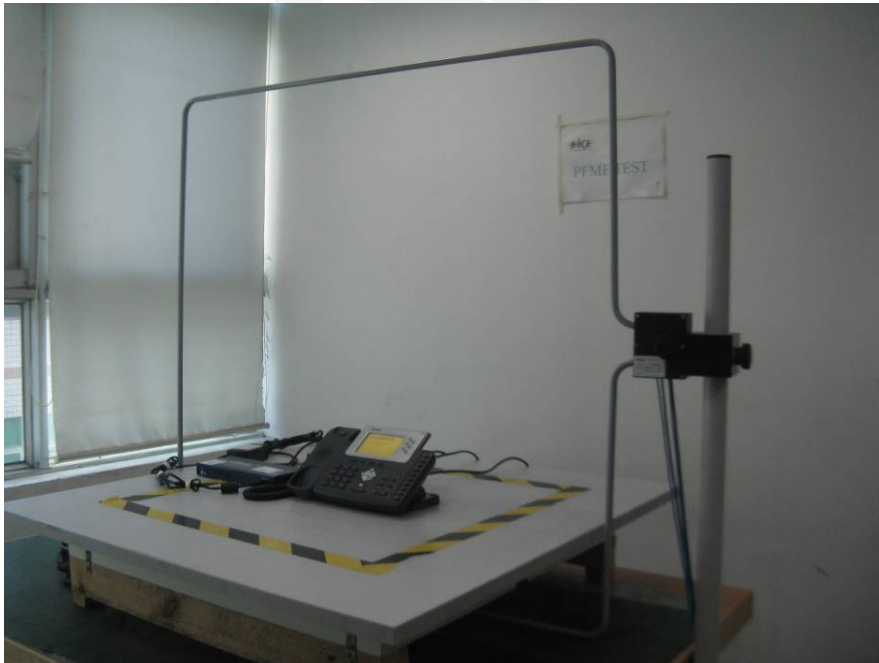
#### 2) PoE power supply:

| Level | Magnetic Field Strength<br>A/m | X (Horizontal) | Y (Vertical) | Z (Special) |
|-------|--------------------------------|----------------|--------------|-------------|
| 1     | 1                              | A              | A            | A           |
| 2     | 3                              | /              | /            | /           |
| 3     | 10                             | /              | /            | /           |
| 4     | 30                             | /              | /            | /           |
| 5     | 100                            | /              | /            | /           |
| X     | Special                        | /              | /            | /           |

Adapter power supply:



PoE power supply:

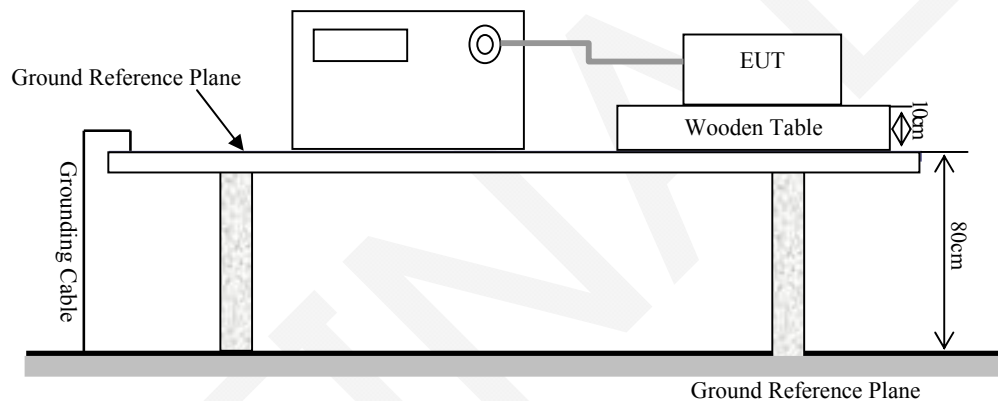


**Test Setup Photos**

**EN 55024 §4.2.5-SURGES (IEC 61000-4-5)****Test Equipment**

| Manufacturer | Description             | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|-----------|---------------|------------------|----------------------|
| EM Test      | Ultra Compact Generator | UCS500-N5 | V0939105172   | 2011-07-04       | 2012-07-03           |
| EM Test      | Auto-transformer        | MV2616    | V0939105173   | 2011-07-04       | 2012-07-03           |
| EM Test      | CDN                     | CNV 504S1 | V0939105175   | 2011-07-04       | 2012-07-03           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup****Test Standard**

EN 55024:2010 (IEC 61000-4-5:2005)

AC Mains: L-N: Test level 2 at 1 kV

L-PE, N-PE: Test level 1 at 0.5 kV

Signal port: Test level 2 at 1 kV

**Test Level**

| Level | Open Circuit Output Test Voltage $\pm 10\%$ |
|-------|---------------------------------------------|
| 1     | 0.5 kV                                      |
| 2     | 1 kV                                        |
| 3     | 2 kV                                        |
| 4     | 4 kV                                        |
| X     | Special                                     |

**Performance criterion: B**

## Test Procedure

- 1) For line to line coupling mode, provide a 0.5 kV 1.2/50us voltage surge (at open-circuit condition).
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## Test Data and Setup Photo

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25℃       |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

The testing was performed by Grace Xi on 2011-08-19.

Test Mode: Talking

- 1) Adapter power supply:

**Table 1: AC mains power input port**

| Level | Voltage | Poll | Path            | Pass | Fail |
|-------|---------|------|-----------------|------|------|
| 1     | 0.5kV   | ±    | L-N             | A    | /    |
| 2     | 1kV     | ±    | L-N             | A    | /    |
| 3     | 2kV     | ±    | L-N, L-PE, N-PE | /    | /    |
| 4     | 4kV     | ±    | L-N, L-PE, N-PE | /    | /    |

**Table 2: RJ45 port**

| Level | Voltage | Poll | Path                   | Pass | Fail |
|-------|---------|------|------------------------|------|------|
| 1     | 0.5kV   | ±    | Line-Ground            | A    | /    |
| 2     | 1kV     | ±    | Line-Ground            | A    | /    |
| 3     | 2kV     | ±    | Line-Line, Line-Ground | /    | /    |
| 4     | 4kV     | ±    | Line-Line, Line-Ground | /    | /    |

### AC mains



### RJ45 port



### Test Setup Photos

**Table 1: AC mains power input port****Table 1: AC mains power input port**

| Level | Voltage | Poll | Path                  | Pass | Fail |
|-------|---------|------|-----------------------|------|------|
| 1     | 0.5kV   | ±    | L-N,L-PE, N-PE,L-N-PE | A    | /    |
| 2     | 1kV     | ±    | L-N,L-PE, N-PE,L-N-PE | A    | /    |
| 3     | 2kV     | ±    | L-PE, N-PE,L-N-PE     | A    | /    |
| 4     | 4kV     | ±    | L-N, L-PE, N-PE       | /    | /    |

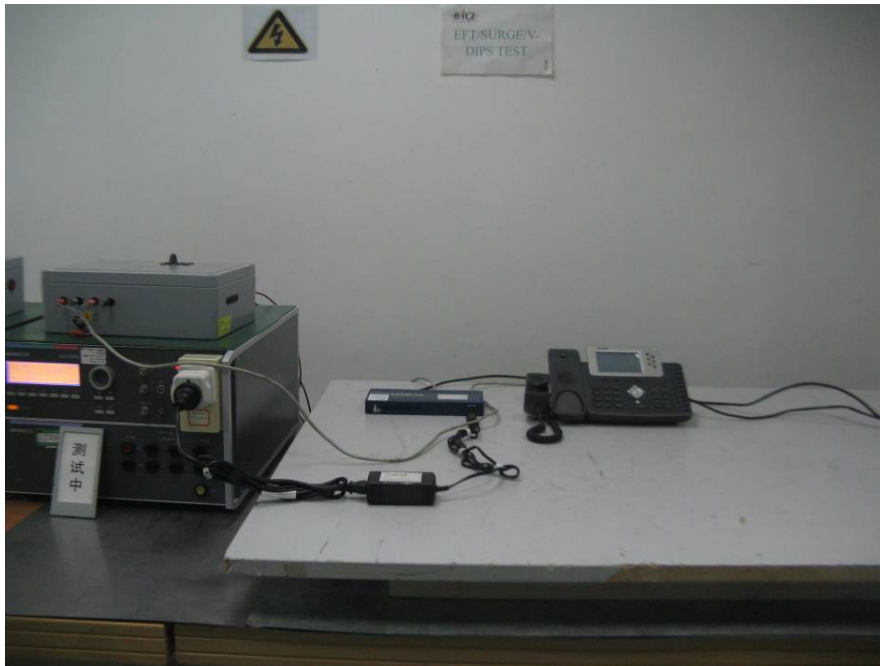
**Table 1: RJ45 port**

| Level | Voltage | Poll | Path                   | Pass | Fail |
|-------|---------|------|------------------------|------|------|
| 1     | 0.5kV   | ±    | Line-Ground            | A    | /    |
| 2     | 1kV     | ±    | Line-Ground            | A    | /    |
| 3     | 2kV     | ±    | Line-Line, Line-Ground | /    | /    |
| 4     | 4kV     | ±    | Line-Line, Line-Ground | /    | /    |

## AC mains



### RJ45 port

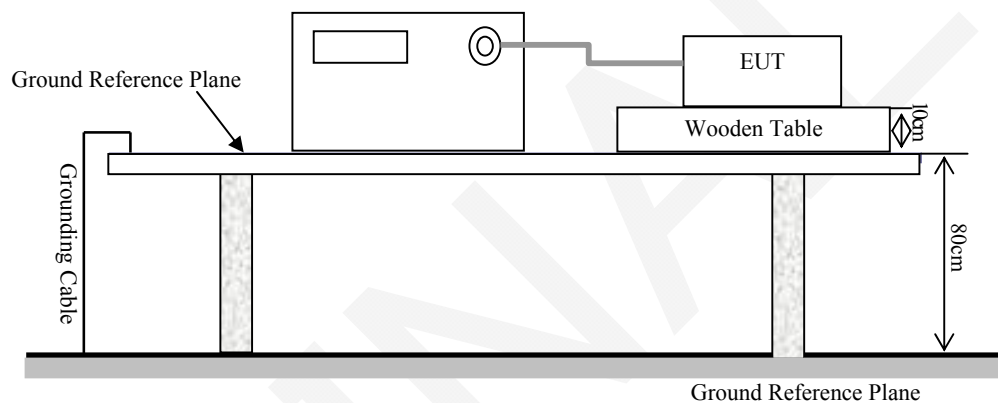


### Test Setup Photos

**EN 55024 §4.2.6-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)****Test Equipment**

| Manufacturer | Description             | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|-----------|---------------|------------------|----------------------|
| EM Test      | Ultra Compact Generator | UCS500-N5 | V0939105172   | 2011-07-04       | 2012-07-03           |
| EM Test      | Auto-transformer        | MV2616    | V0939105173   | 2011-07-04       | 2012-07-03           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test Setup****Test Standard**

EN 55024:2010 (IEC 61000-4-11:2004)  
Test levels and Performance Criterion

**Test Level**

| Test Level | Voltage dip and short interruptions<br>%UT | Duration<br>(Periods) | Performance<br>Criterion |
|------------|--------------------------------------------|-----------------------|--------------------------|
| 1          | >95                                        | 0.5                   | B                        |
| 2          | 30                                         | 25                    | C                        |
| 3          | >95                                        | 250                   | C                        |

**Test Procedure**

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

**Test Data and Setup Photo****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25℃       |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Grace Xi on 2011-08-19.*

*Test Mode: Talking*

1) Adapter power supply:

| Level | U2<br>(% Reduction) | Td(Periods) | Phase Angle  | N | Pass | Fail |
|-------|---------------------|-------------|--------------|---|------|------|
| 1     | >95                 | 0.5         | 0/90/180/270 | 3 | A    | /    |
| 2     | 30                  | 25          | 0/90/180/270 | 3 | B    | /    |
| 3     | >95                 | 250         | 0/90/180/270 | 3 | B    | /    |



**Test Setup Photo**

## 2) PoE power supply:

| Level | U2<br>(% Reduction) | Td(Periods) | Phase Angle  | N | Pass | Fail |
|-------|---------------------|-------------|--------------|---|------|------|
| 1     | >95                 | 0.5         | 0/90/180/270 | 3 | A    | /    |
| 2     | 30                  | 25          | 0/90/180/270 | 3 | A    | /    |
| 3     | >95                 | 250         | 0/90/180/270 | 3 | B    | /    |



Test Setup Photo

## **EN 61000-3-2-HARMONIC CURRENT EMISSIONS**

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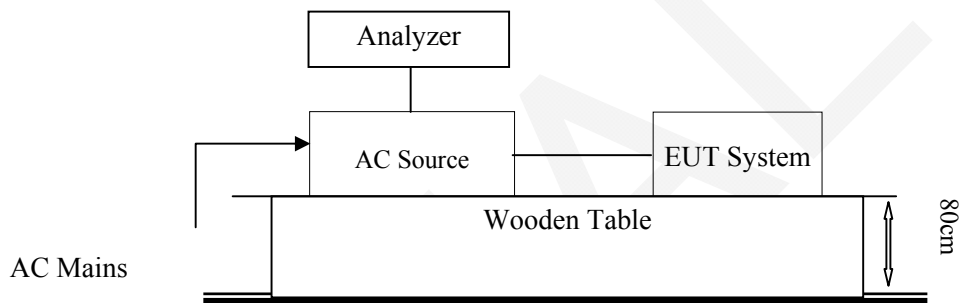
According to EN 61000-3-2:2006 + A1:2009 + A2:2009 section 7: Equipment with a rated power of 75 W or less, other than discharge lighting equipment, are not included in this standard.

FINAL

**EN 61000-3-3- VOLTAGE FLUCTUATION AND FLICKER****Test Equipment**

| Manufacturer | Description               | Model    | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------------------|----------|---------------|------------------|----------------------|
| EM Test      | Harmonic/Flicker Analyzer | DPA 500N | V0939105176   | 2010-11-11       | 2011-11-10           |
| EM Test      | AC Source                 | ACS500   | 1101-02       | 2011-03-25       | 2012-03-24           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup****Test Standard**

EN 61000-3-3:2008

**Flicker Test Limits :**

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of  $P_{st}$  shall not be greater than 1,0;
- the value of  $P_{lt}$  shall not be greater than 0,65;
- the value of  $d(t)$  during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change,  $d_c$ , shall not exceed 3,3 %;
- the maximum relative voltage change  $d_{max}$ , shall not exceed
  - a) 4 % without additional conditions;
  - b) 6 % for equipment which is:
    - switched manually, or
    - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

c) 7 % for equipment which is

- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

## Test Data and Setup Photo

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25°C      |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 100.0 kPa |

|                          |                                              |
|--------------------------|----------------------------------------------|
| <b>Date of test:</b>     | 15:53 19 Aug. 2011                           |
| <b>Tester:</b>           | Grace Xi                                     |
| <b>Standard used:</b>    | EN/IEC 61000-3-3 Flicker                     |
| <b>Short time (Pst):</b> | 10 min                                       |
| <b>Observation time:</b> | 10 min (1 Flicker measurement)               |
| <b>Flicker meter:</b>    | 230V / 50Hz                                  |
| <b>Customer:</b>         | YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD |
| <b>E. U. T.:</b>         | IP PHONE                                     |
| <b>Model:</b>            | SIP-T28P                                     |
| <b>Test Mode:</b>        | Talking (adapter power supply)               |

**Maximum Flicker results**

|                 | EUT values | Limit | Result |
|-----------------|------------|-------|--------|
| <b>Pst</b>      | 0.028      | 1.00  | PASS   |
| <b>dc [%]</b>   | 0.012      | 3.30  | PASS   |
| <b>dmax [%]</b> | 0.061      | 4.00  | PASS   |
| <b>dt [s]</b>   | 0.000      | 0.50  | PASS   |

**Test Setup Photo**

|                          |                                              |
|--------------------------|----------------------------------------------|
| <b>Date of test:</b>     | 16:19 19 Aug. 2011                           |
| <b>Tester:</b>           | Grace Xi                                     |
| <b>Standard used:</b>    | EN/IEC 61000-3-3 Flicker                     |
| <b>Short time (Pst):</b> | 10 min                                       |
| <b>Observation time:</b> | 10 min (1 Flicker measurement)               |
| <b>Flicker meter:</b>    | 230V / 50Hz                                  |
| <b>Customer:</b>         | YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD |
| <b>E. U. T.:</b>         | IP PHONE                                     |
| <b>Model:</b>            | SIP-T28P                                     |
| <b>Test Mode:</b>        | Talking (PoE power supply)                   |

### Maximum Flicker results

|                 | EUT values | Limit | Result |
|-----------------|------------|-------|--------|
| <b>Pst</b>      | 0.028      | 1.00  | PASS   |
| <b>dc [%]</b>   | 0.013      | 3.30  | PASS   |
| <b>dmax [%]</b> | 0.054      | 4.00  | PASS   |
| <b>dt [s]</b>   | 0.000      | 0.50  | PASS   |



Test Setup Photo

## EXHIBIT A - PRODUCT LABELING

### Label Specification



**Specifications:** The marking set out above must be affixed to the apparatus or to its data plate and have a minimum height of 5 mm. The elements should be easily readable and indelible. They may be placed anywhere on the apparatus case or in its battery compartment. No tool should be needed to view the marking.

### Label Location on EUT



## EXHIBIT B - EUT PHOTOGRAPHS

**EUT – Full View**



**EUT – Top View 1**



### EUT – Top View 2



### EUT – Bottom View



**EUT – Front View**



**EUT – Rear View**



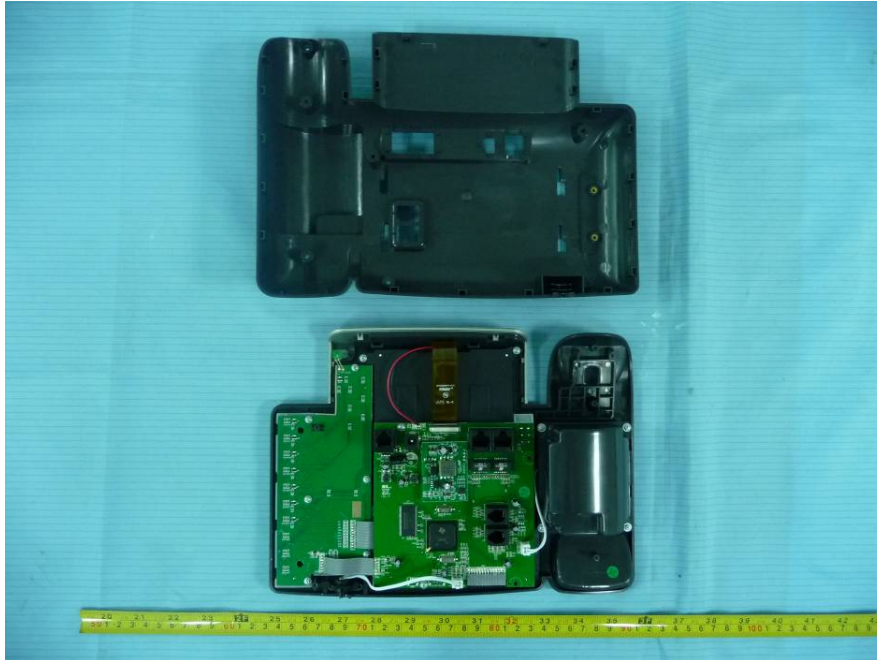
**EUT – Left View**



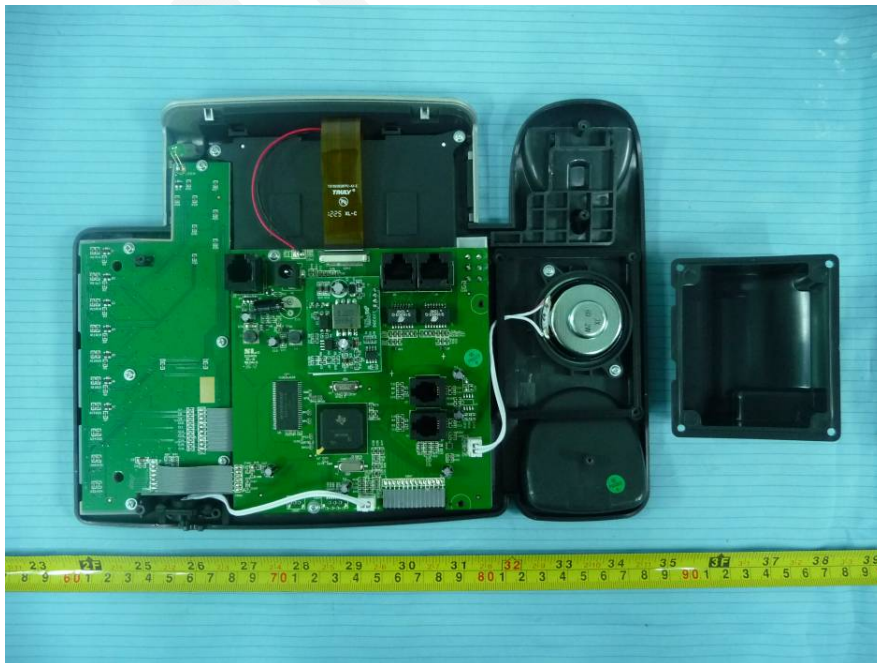
**EUT – Right View**



### EUT – Cover off View 1



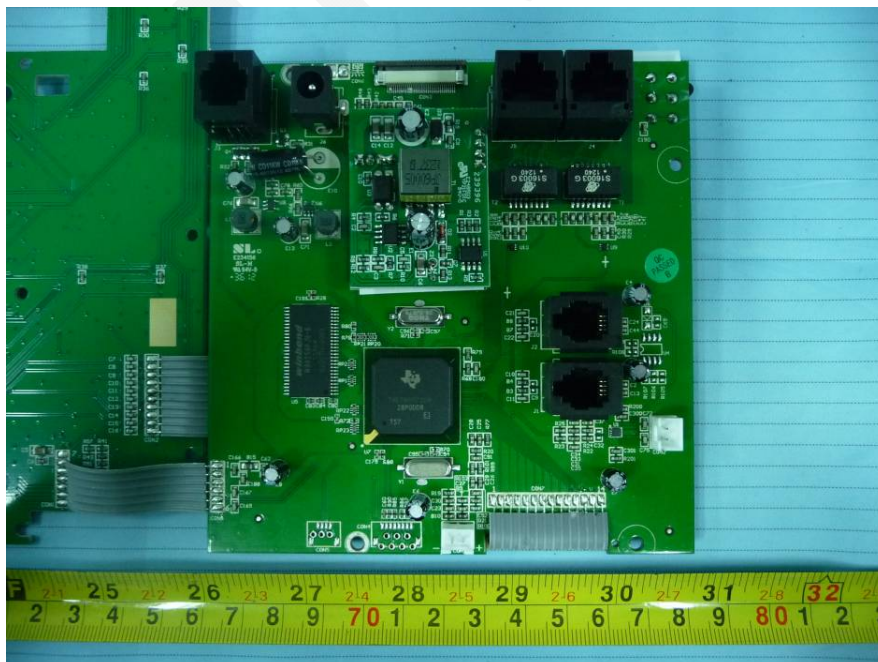
### EUT – Cover off View 2



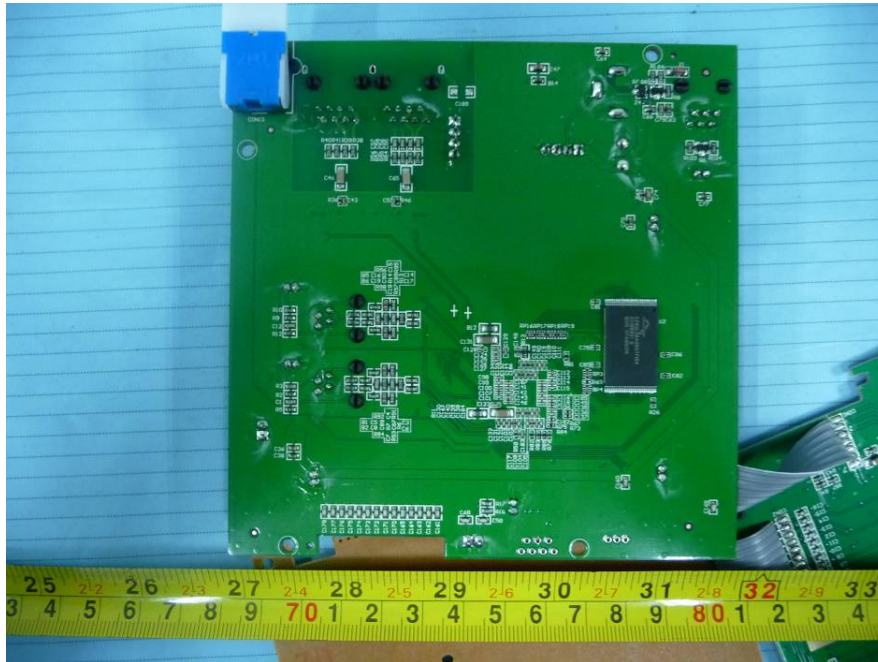
### EUT – Handset Cover off View



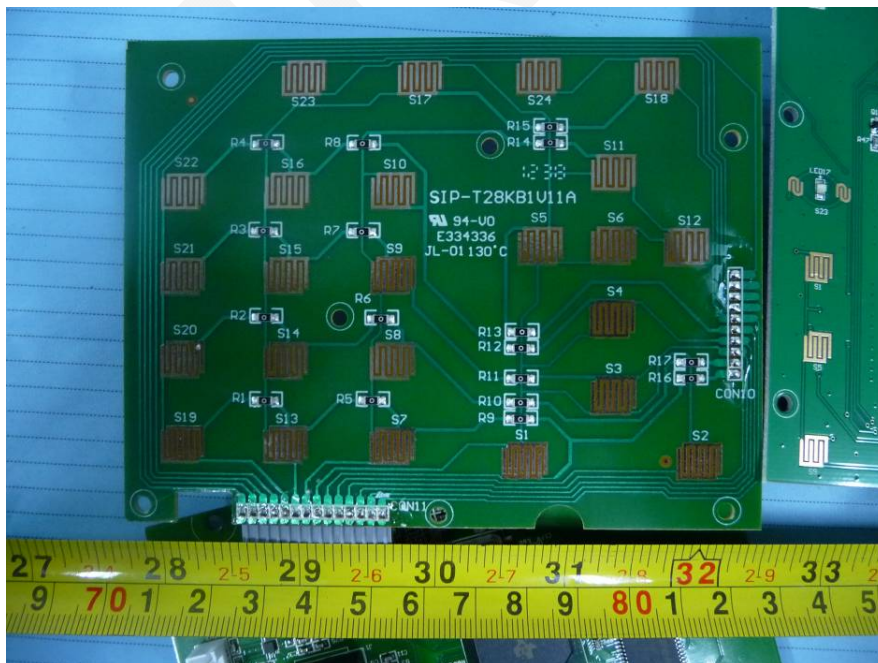
### EUT – Main Board Top View



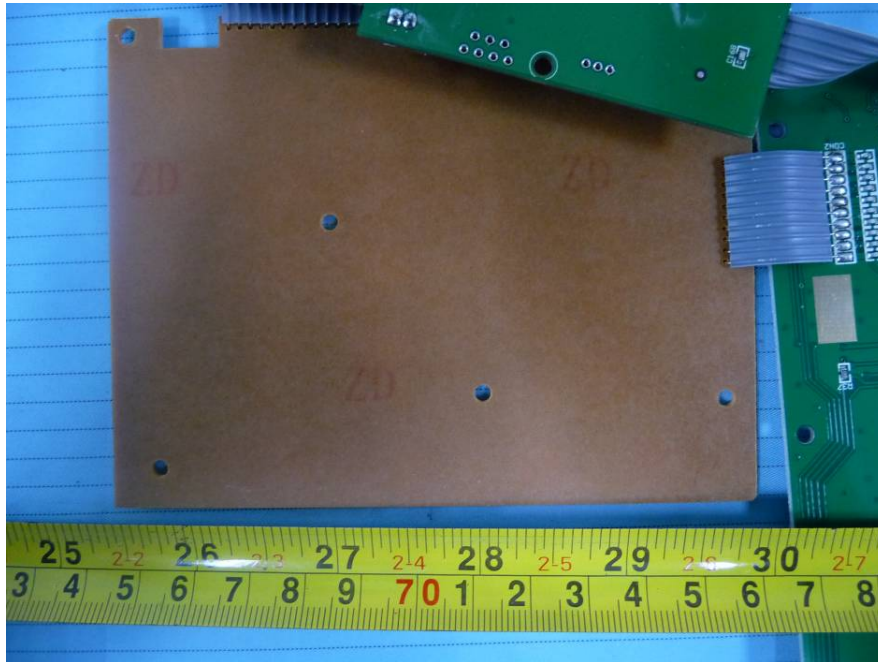
### EUT – Main Board Bottom View



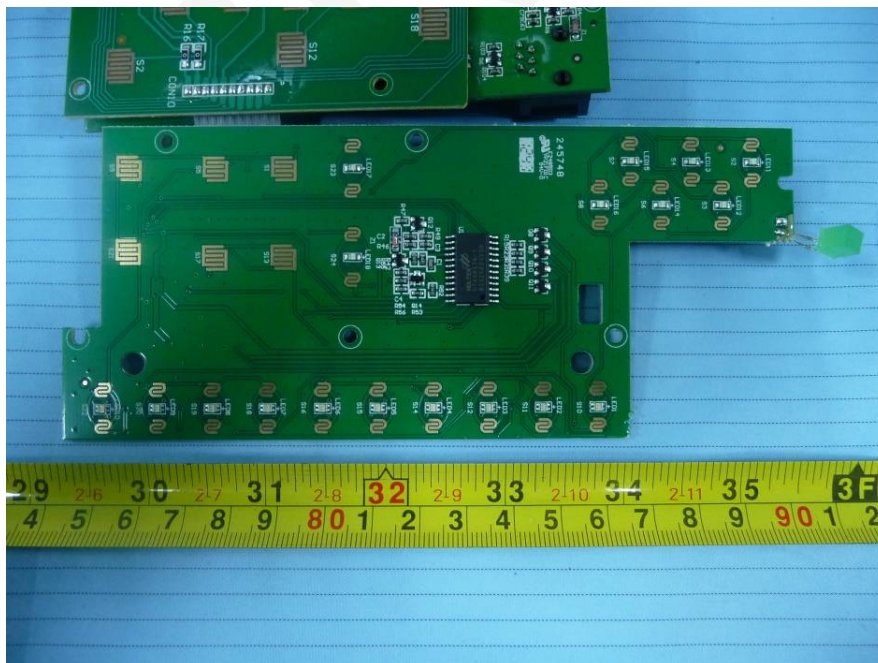
### EUT – Key Board 1 Top View



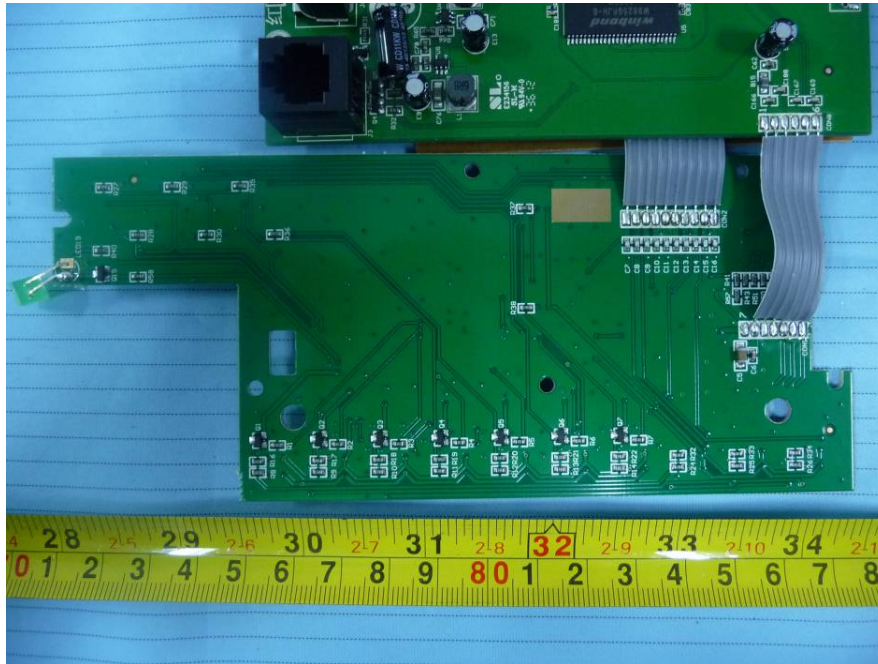
### EUT – Key Board 1 Bottom View



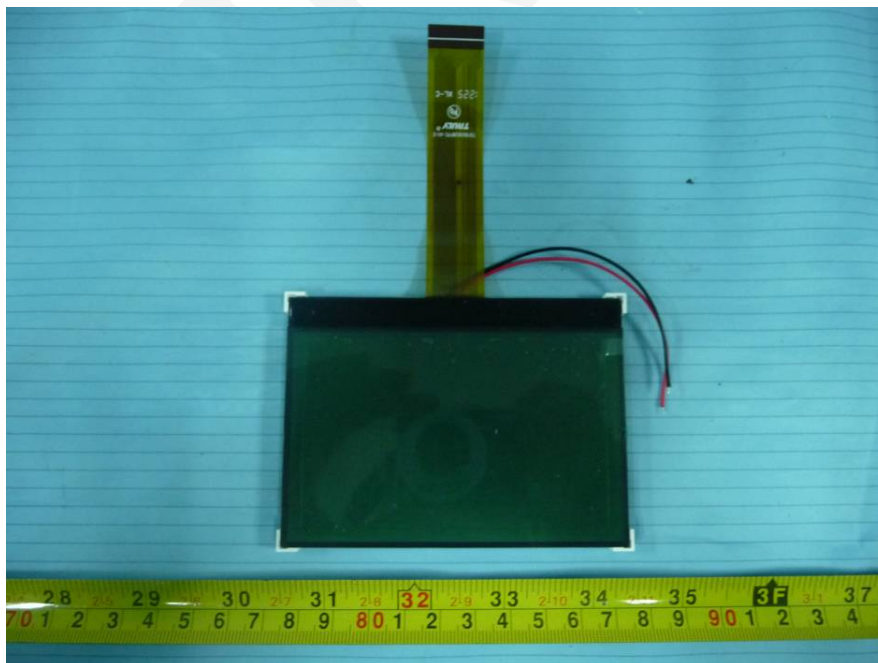
### EUT – Key Board 2 Top View



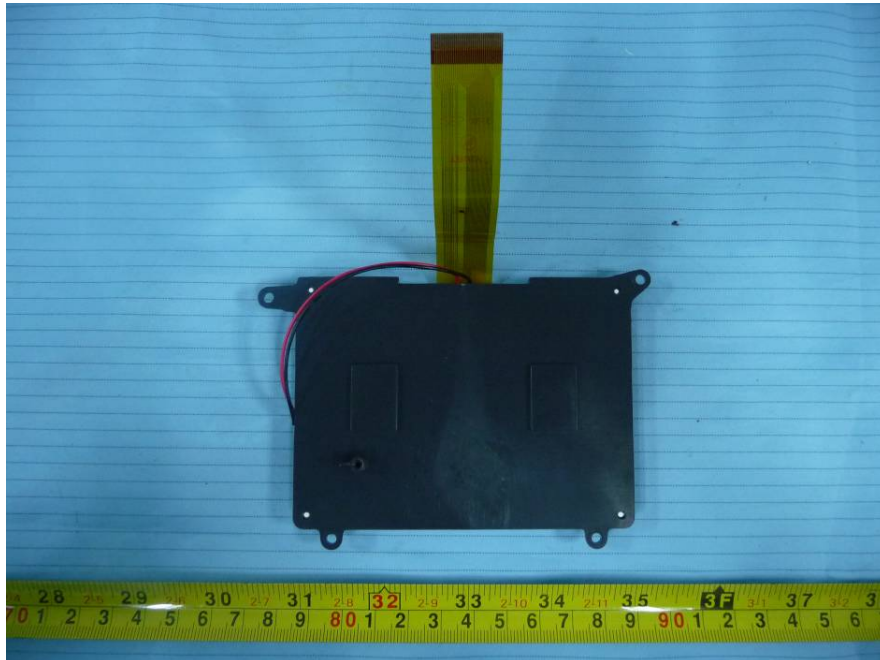
### EUT – Key Board 2 Bottom View



### EUT – LCD Screen Top View



### EUT – LCD Screen Bottom View



### EUT – Label View



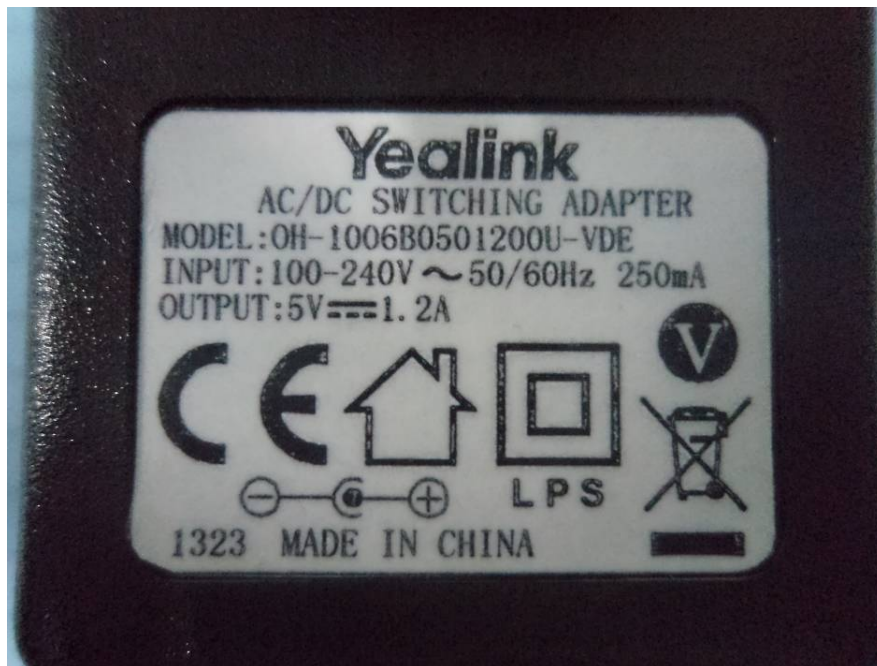
### EUT – Adapter 1 View



### EUT – Adapter 1 Label View



### EUT – Adapter 2 Label View



### EUT – Adapter 3 Label View



## **EXHIBIT C - TEST SETUP PHOTOGRAPHS**

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**Conducted Disturbance - Front View (Adapter 1 power supply)**



**Conducted Disturbance - Side View (Adapter 1 power supply)**



**Conducted Disturbance - Front View (Adapter 2 power supply)**



**Conducted Disturbance - Side View (Adapter 2 power supply)**



**Conducted Disturbance - Front View (Adapter 3 power supply)**



**Conducted Disturbance - Side View (Adapter 3 power supply)**



**Conducted Disturbance - Front View (PoE power supply)**



**Conducted Disturbance - Side View (PoE power supply)**



**Conducted Disturbance - Front View (RJ45 Port)**



**Conducted Disturbance - Side View (RJ45 Port)**



**Below 1 GHz: Radiated Disturbance - Front View (Adapter 1 power supply)**



**Below 1 GHz: Radiated Disturbance - Rear View (Adapter 1 power supply)**



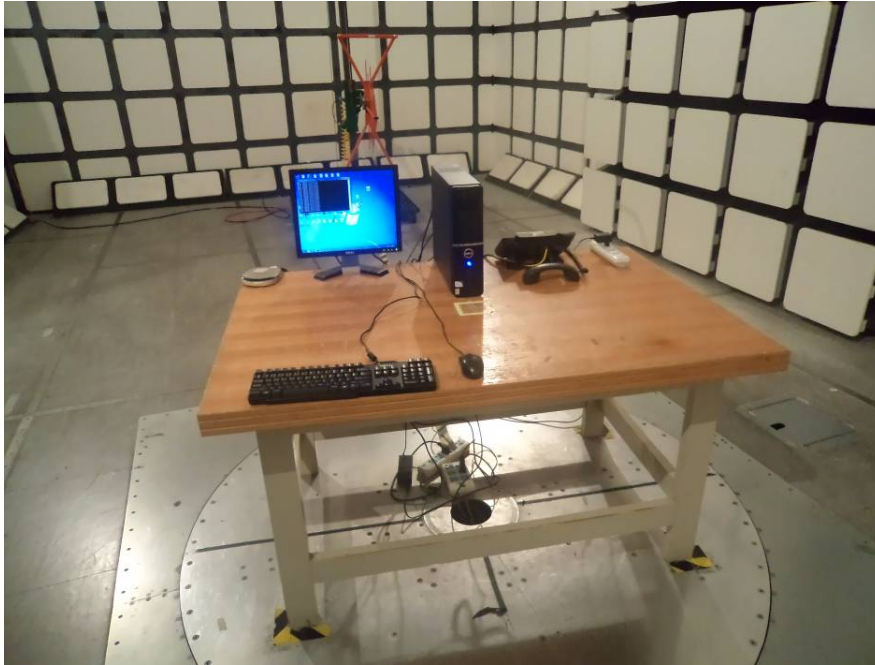
**Above 1 GHz: Radiated Disturbance - Front View (Adapter 1 power supply)**



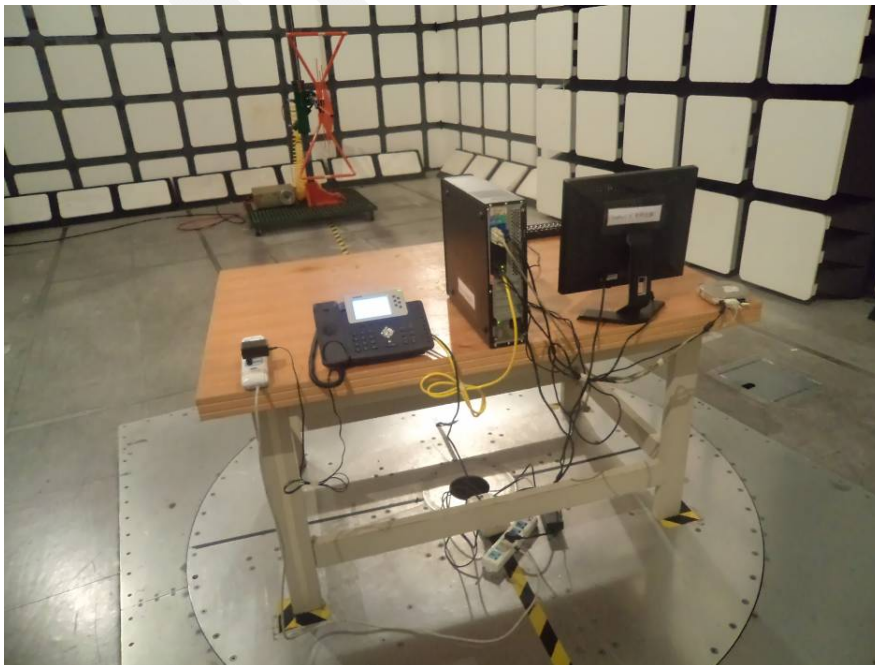
**Above 1 GHz: Radiated Disturbance - Rear View (Adapter 1 power supply)**



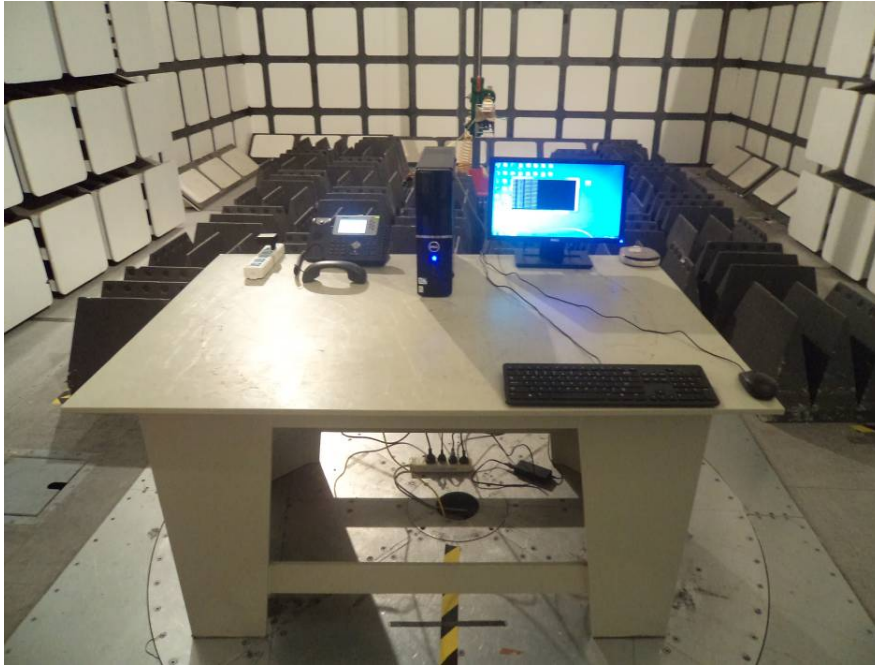
**Below 1 GHz: Radiated Disturbance - Front View (Adapter 2 power supply)**



**Below 1 GHz: Radiated Disturbance - Rear View (Adapter 2 power supply)**



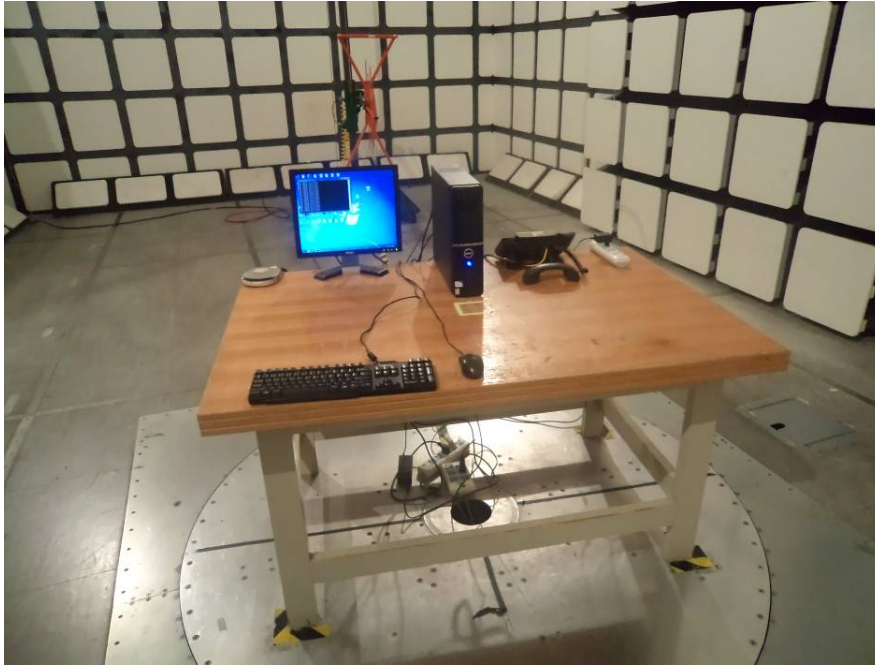
**Above 1 GHz: Radiated Disturbance - Front View (Adapter 2 power supply)**



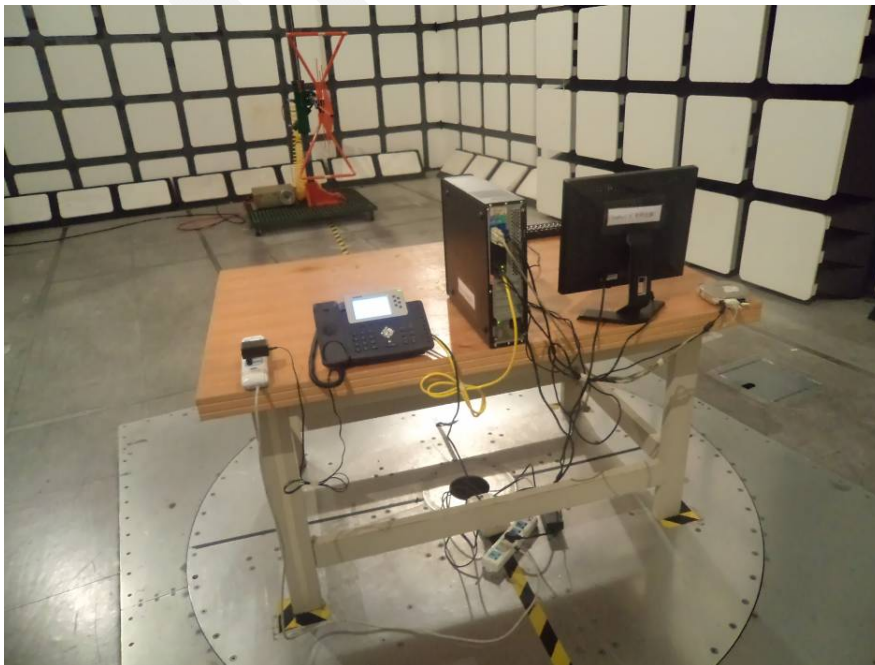
**Above 1 GHz: Radiated Disturbance - Rear View (Adapter 2 power supply)**



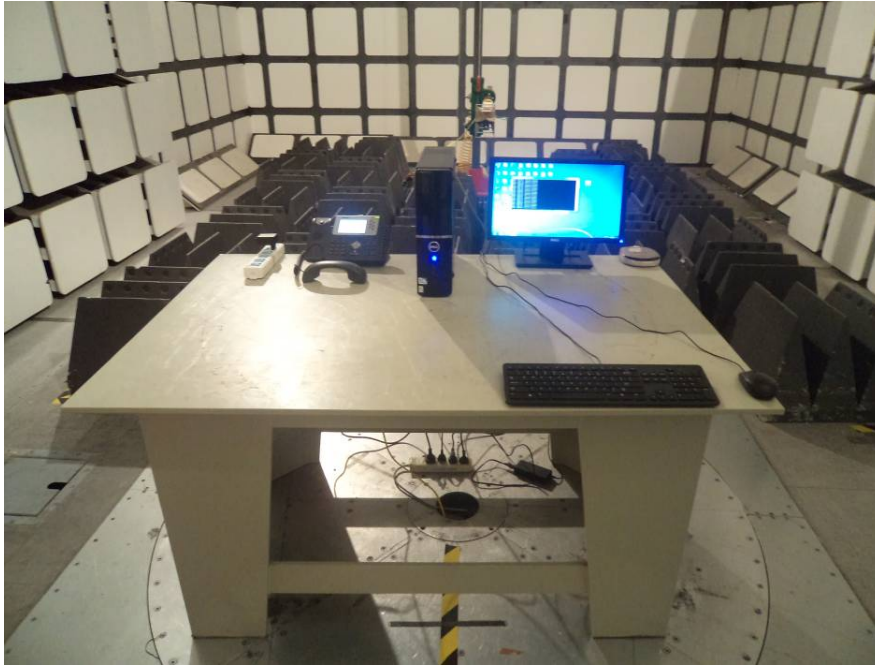
**Below 1 GHz: Radiated Disturbance - Front View (Adapter 3 power supply)**



**Below 1 GHz: Radiated Disturbance - Rear View (Adapter 3 power supply)**



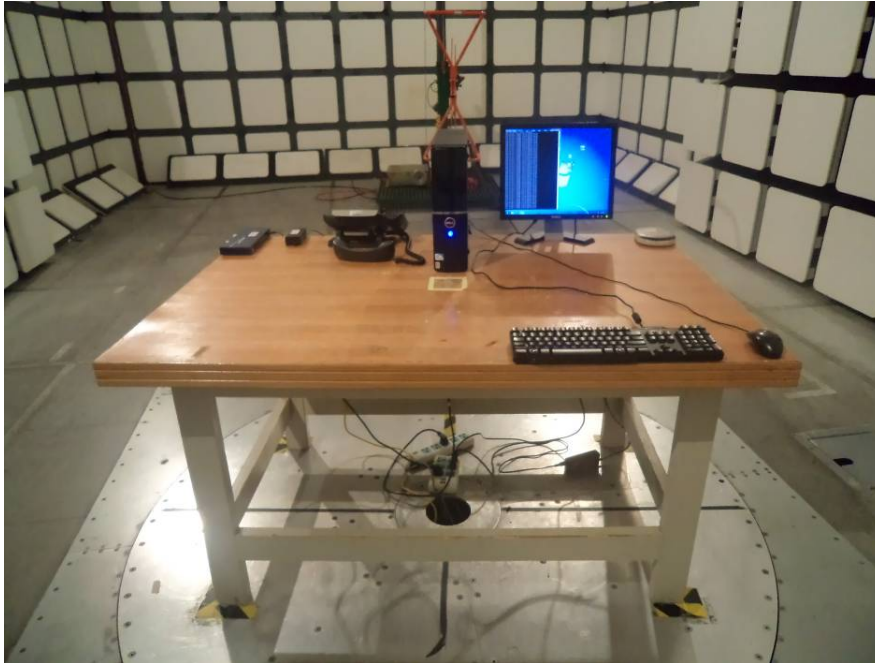
**Above 1 GHz: Radiated Disturbance - Front View (Adapter 3 power supply)**



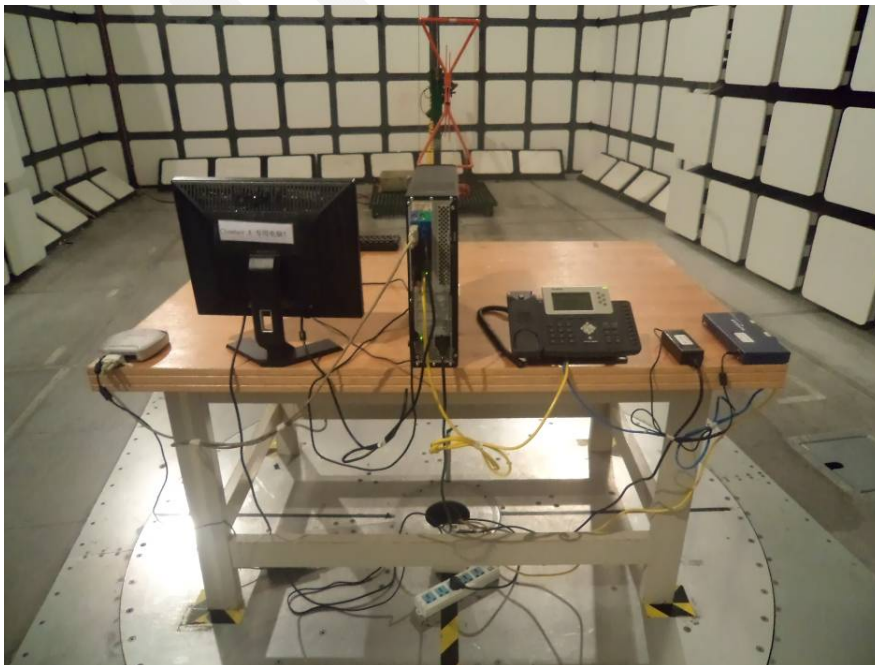
**Above 1 GHz: Radiated Disturbance - Rear View (Adapter 3 power supply)**



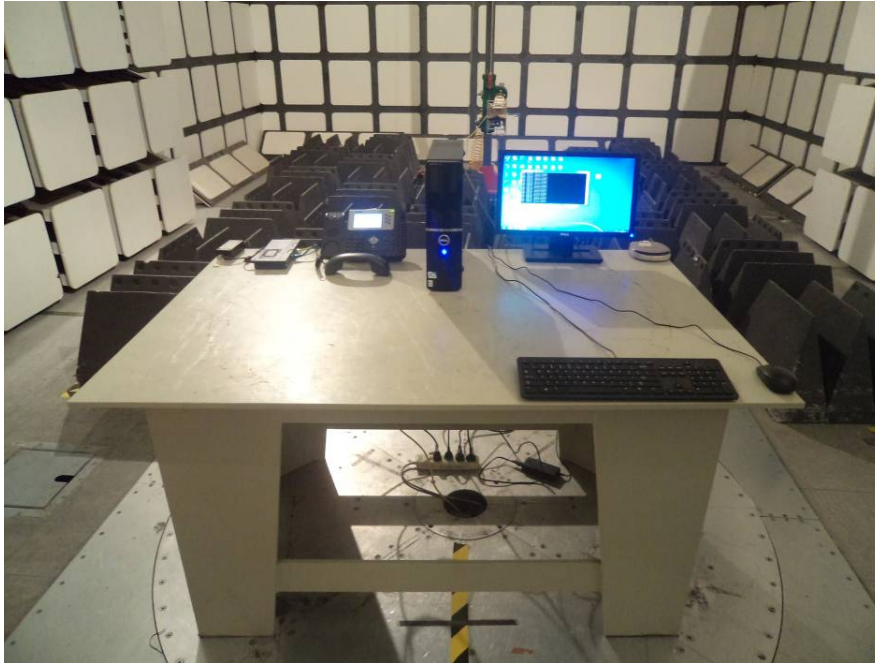
**Below 1 GHz: Radiated Disturbance - Front View (PoE power supply)**



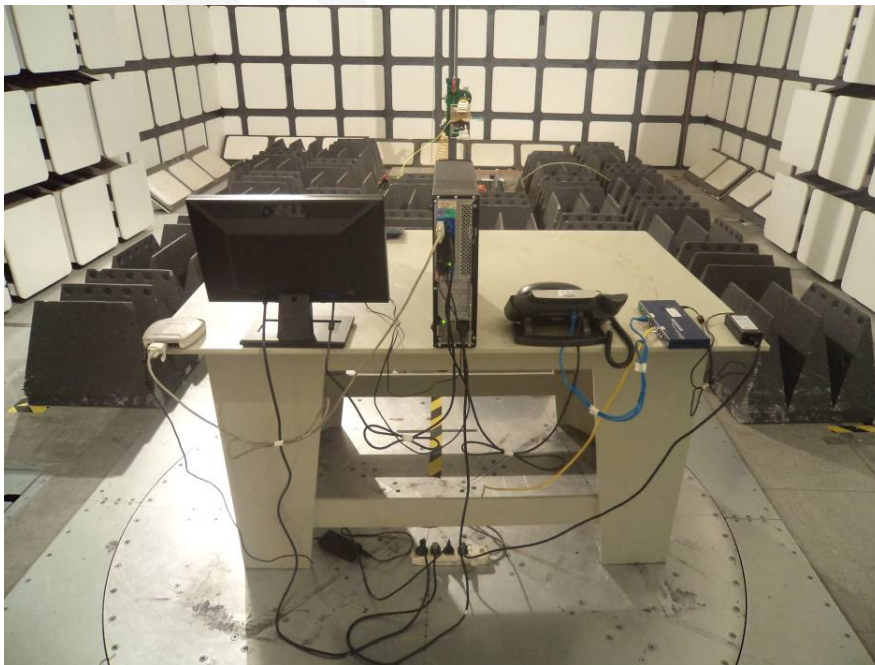
**Below 1 GHz: Radiated Disturbance - Rear View (PoE power supply)**



**Above 1 GHz: Radiated Disturbance - Front View (PoE power supply)**



**Above 1 GHz: Radiated Disturbance - Rear View (PoE power supply)**



## DECLARATION LETTER

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2013-6-21

### Product Similarity Declaration Letter

To Whom It May Concern,

We, Yealink (Xiamen) Network Technology Co., LTD. hereby declare that our product IP Phone, the model SIP-T28P and SIP-T28 are electrically identical, they have the same PCB layout and schematic, the only difference is the model T28P with POE circuit, the model T28 without POE circuit. SIP-T28P was tested by BACL.

Please contact me if you have any question.

Signature:

A handwritten signature in black ink that reads "Stone Lu".

Stone Lu

Vice General Manager

\*\*\*\*\* END OF REPORT \*\*\*\*\*