# FCC TEST REPORT

of

# CFR 47 Part 15 Subpart B Class B

Application Type: Declaration of Conformity

Product : **PHANES-HR 2.5" SATA III SSD**

Model(s): **7SR**

Brand: **APRO**

Applicant: **APRO CO., LTD.**

Address: **11F-5, No.738, Zongzheng Rd., Zonghe Dist. New Taipei City, 23511 Taiwan.**

Test Performed by:

**International Standards Laboratory**

<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; SL2-R1/R2-E-0013; TAF: 0997
FCC: TW1036; IC: IC4067B-1; NEMKO: ELA 113B
VCCI: <Conduction 02>C-1440, T-1676, <Conduction 03>C-2845, T-1464, <Conduction 04>C-4778, T-2295, <Chamber 02>R-1435, G-17, <Chamber 12>R-2598, G-16, <Chamber 14>G-211,
*Address:
No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel: 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-15LE597FB-MB**

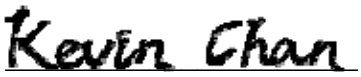
Issue Date : **November 28, 2016**

This report totally contains 24 pages including this cover page and contents page.

## Contents of Report

# 1. General

## 1.1 Certification of Accuracy of Test Data

| | |
|---|---|
| **Standards:** | FCC CFR Title 47 Part 15 Subpart B: 2014- Section 15.107 and 15.109<br>ANSI C63.4-2009<br>Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012 |
| **Equipment Tested:** | PHANES-HR 2.5" SATA III SSD |
| **Model:** | 7SR |
| **Brand:** | APRO |
| **Applicant:** | APRO CO., LTD. |
| **Sample received Date:** | November 27, 2015 |
| **Final test Date:** | refer to the date of test data |
| **Test Site:** | International Standards Laboratory<br>Chamber 02; Chamber 14; Conduction 02 |
| **Test Distance:** | 10M; 3M (above1GHz) |
| **Temperature:** | refer to each site test data |
| **Humidity:** | refer to each site test data |
| **Input power:** | Conduction input power: AC 120 V / 60 Hz<br>Radiation input power: AC 120 V / 60 Hz |
| **Test Result:** | **PASS** |
| **Report Engineer:** | Vivian Chang |
| **Test Engineer:** |  <br>Kevin Chan |
| **Approved By:** |  <br>W.H. Chang / Director |

### 1.2 Description of EUT

# EUT

| | |
|---|---|
| Description: | PHANES-HR 2.5" SATA III SSD |
| Condition: | Pre-Production |
| Model: | 7SR |
| Serial Number: | N/A |
| Control IC: | PS3110-S10 |
| Power: | From Personal Computer SATA port Supply |
| PCBA Number: | A085010MEG20001N |
| Memory Capacity: | 1GB ~ 512GB |
| Highest working frequency: | 6GHz |
| The radiation test should be tested till 30GHz | |

**Exterior Model Difference:**

| Configuration | Exterior | Control IC | Memory Capacity |
|---|---|---|---|
| 1 | Rectangular | PS3110-S10 | 512GB |
| 2 | Arcuate | PS3110-S10 | 512GB |

**The memory capacities listed below is chosen by the applicant to be the representative configuration for testing in this report.**
**For test configurations:**

| Configuration | Exterior | Control IC | Memory Capacity |
|---|---|---|---|
| 1 | Rectangular | PS3110-S10 | 512GB |

**EMI Noise Source:**

| Refer to the photo | Control IC | Point |
|---|---|---|
| EUT-9 | 30MHz | U1 |

**EMI Noise Source:**
N/A

## 1.3 Description of Support Equipment

| No | Unit | Model / Serial No. | Brand | Power Cord | FCC ID |
|---|---|---|---|---|---|
| 1 | Personal Computer | DX7400 S/N: N/A | HP | Non-shielded | FCC DOC |
| 2 | PS/2 Keyboard | Y-S0002 S/N: N/A | Logitch | N/A | FCC DOC |
| 3 | PS/2 Mouse | M-SBM96B S/N: NA | Logitch | N/A | FCC DOC |
| 4 | HP Printer | C930 S/N: N/A | HP | Non-shielded | FCC DOC |
| 5 | Aceex Modem | DM1414 S/N: N/A | Aceex | Non-shielded | FCC DOC |
| 6 | 27" LCD Monitor | B273HU S/N: NA | acer | Non-shielded | FCC DOC |

## 1.4 Software for Controlling Support Unit

**Test programs exercising various part of EUT were used. The programs were executed as follows:**

**Test configuration:**

1. PC running Winthrax to read and write the EUT.
2. Send signal to the Printer through PC Parallel Port.
3. Send signal to the Modem through PC Serial Port.
4. Send H pattern to the LCD Monitor through PC D-SUB Port.
5. Repeat the above steps.

| | Filename | Issued Date |
|---|---|---|
| EUT | Winthrax | 06/04/2005 |
| Printer | IntelEMC.exe | 04/11/2007 |
| Modem | IntelEMC.exe | 04/11/2007 |
| Monitor | IntelEMC.exe | 04/11/2007 |

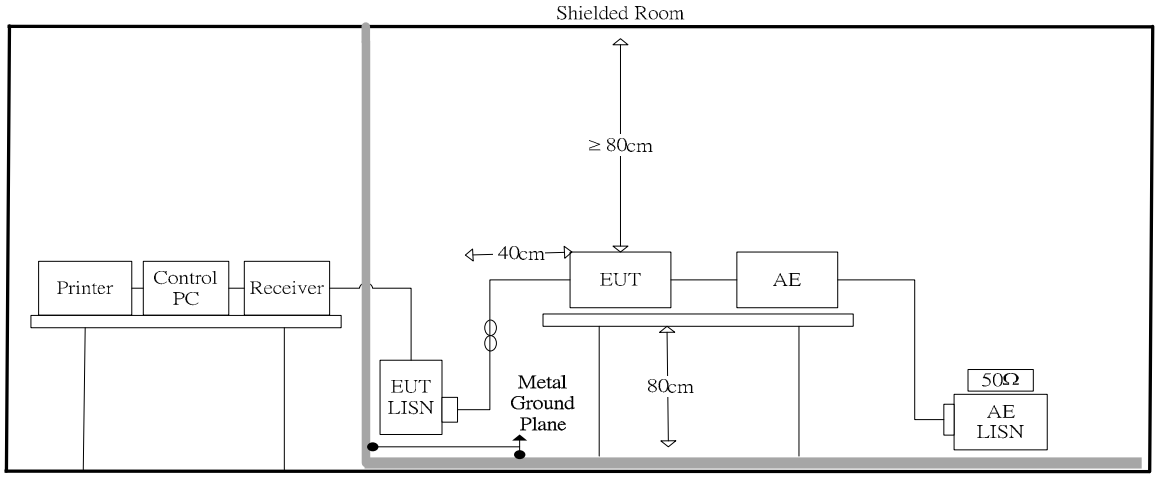
## 1.5 I/O Cable Condition of EUT and Support Units

| Description | Path | Cable Length | Cable Type |
|---|---|---|---|
| AC Power Cable | 110V (~240V) to PC SPS | 1.8m | Non-shielded |
| PS/2 Keyboard Data Cable | PS/2 Keyboard to PC PS/2 Keyboard Port | 1.8m | Shielded |
| PS/2Mouse Data Cable | PS/2Mouse to PC PS/2 Mouse Port | 1.8m | Shielded |
| Printer Data Cable | Printer to PC Parallel Port | 1.8m | Shielded |
| Modem Data Cable | Modem to PC Serial Port | 1.8m | Shielded |
| Monitor Data Cable | Monitor D-SUB Port to PC D-SUB Port | 1.8m | Shielded (with core) |

# 2. Powerline Conducted Emissions

## 2.1 Test Setup and Procedure

### 2.1.1 Test Setup




### 2.1.2 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to ANSI C63.4 requirements.

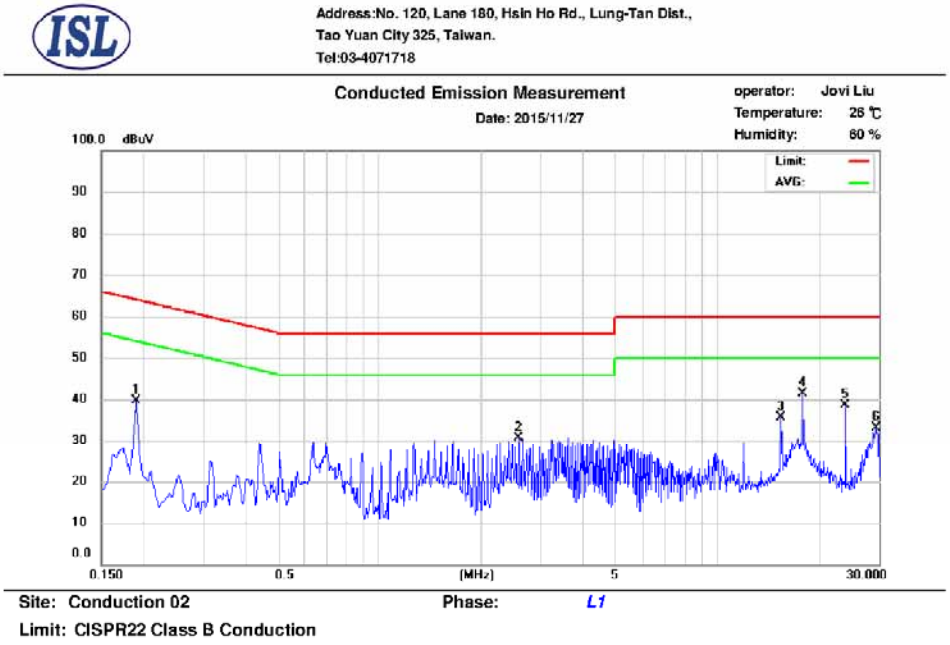
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

### 2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

| | |
|---|---|
| Frequency Range: | 150KHz~30MHz |
| Detector Function: | Quasi-Peak / Average Mode |
| Resolution Bandwidth: | 9KHz |

## 2.2 Conduction Test Data: Configuration 1

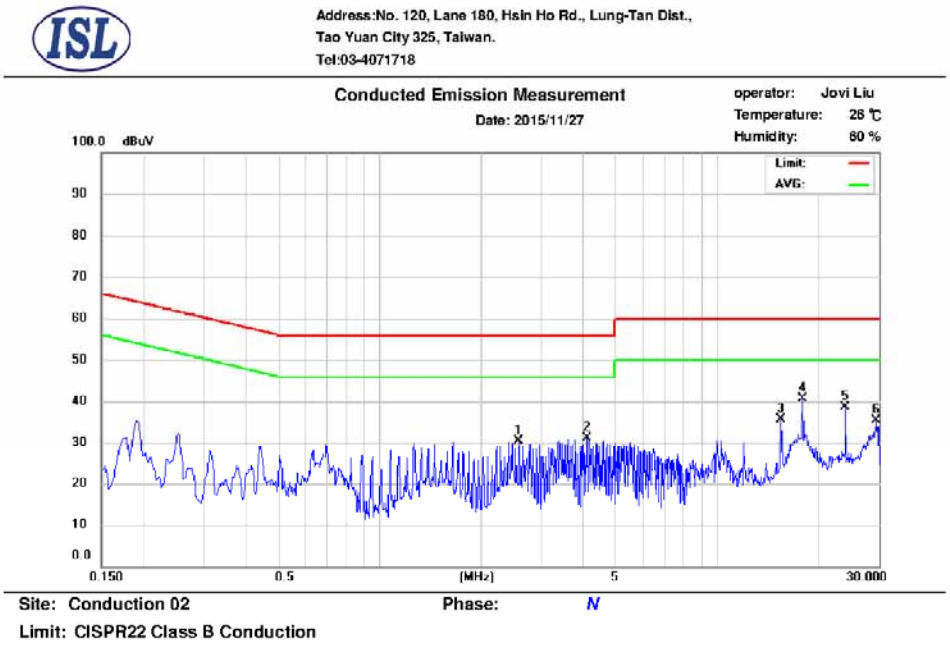
### Table 2.2.1 Power Line Conducted Emissions (Line)




| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.190 | 25.78 | 19.23 | 9.65 | 35.43 | 64.04 | -28.61 | 28.88 | 54.04 | -25.16 |
| 2 | 2.594 | 19.74 | 17.36 | 9.73 | 29.47 | 56.00 | -26.53 | 27.09 | 46.00 | -18.91 |
| 3 | 15.450 | 23.71 | 22.38 | 9.96 | 33.67 | 60.00 | -26.33 | 32.34 | 50.00 | -17.66 |
| 4 | 17.922 | 29.24 | 29.15 | 10.00 | 39.24 | 60.00 | -20.76 | 39.15 | 50.00 | -10.85 |
| 5 | 23.898 | 27.68 | 27.83 | 10.02 | 37.70 | 60.00 | -22.30 | 37.85 | 50.00 | -12.15 |
| 6 | 29.466 | 19.27 | 8.76 | 10.02 | 29.29 | 60.00 | -30.71 | 18.78 | 50.00 | -31.22 |

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
**The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.**
**If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.**
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**

## Table 2.2.2 Power Line Conducted Emissions (Neutral)




| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.594 | 19.14 | 16.72 | 9.71 | 28.85 | 56.00 | -27.15 | 26.43 | 46.00 | -19.57 |
| 2 | 4.110 | 17.67 | 14.55 | 9.75 | 27.42 | 56.00 | -28.58 | 24.30 | 46.00 | -21.70 |
| 3 | 15.450 | 23.65 | 22.31 | 10.03 | 33.68 | 60.00 | -26.32 | 32.34 | 50.00 | -17.66 |
| 4 | 17.922 | 28.93 | 28.75 | 10.09 | 39.02 | 60.00 | -20.98 | 38.84 | 50.00 | -11.16 |
| 5 | 23.898 | 28.18 | 28.22 | 10.14 | 38.32 | 60.00 | -21.68 | 38.36 | 50.00 | -11.64 |
| 6 | 29.610 | 16.14 | 8.18 | 10.16 | 26.30 | 60.00 | -33.70 | 18.34 | 50.00 | -31.66 |

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
**The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.**
**If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.**
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**

## 2.3 Test Setup Photo

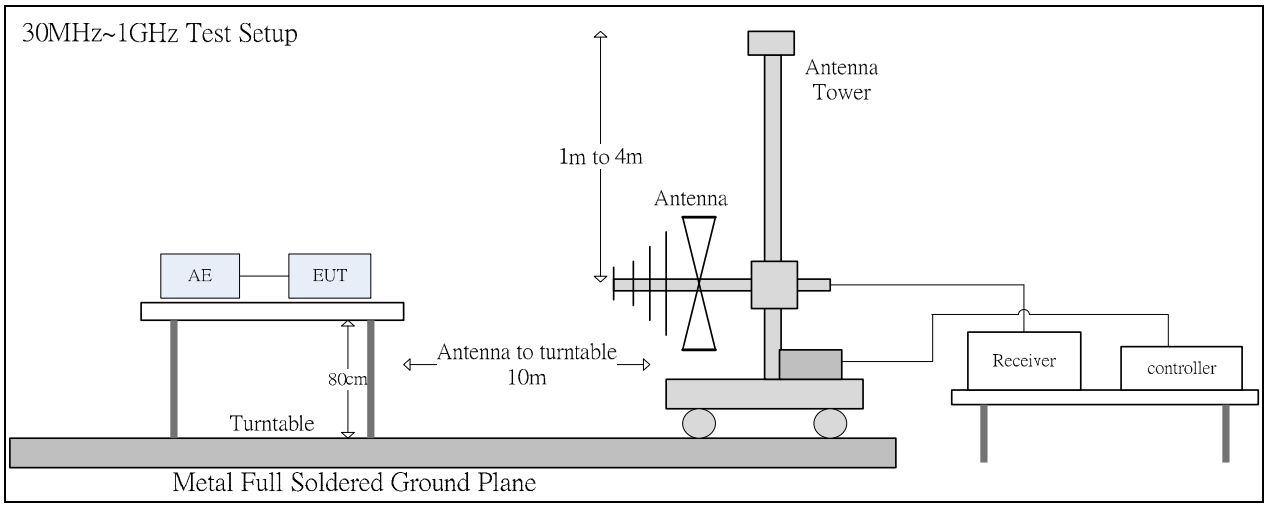
Front View

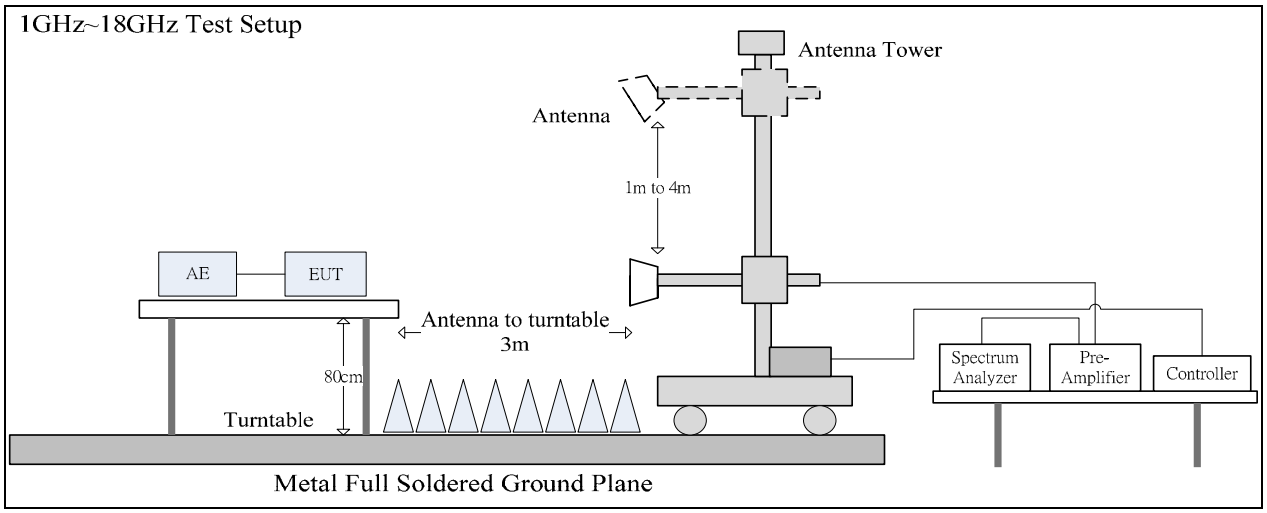
Back View

# 3. Radiated Emissions

## 3.1 Test Setup and Procedure

### 3.1.1 Test Setup



### 3.1.2 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites or 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 40 GHz were analyzed in details by operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the cone of radiation from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to ANSI C63.4 requirements.

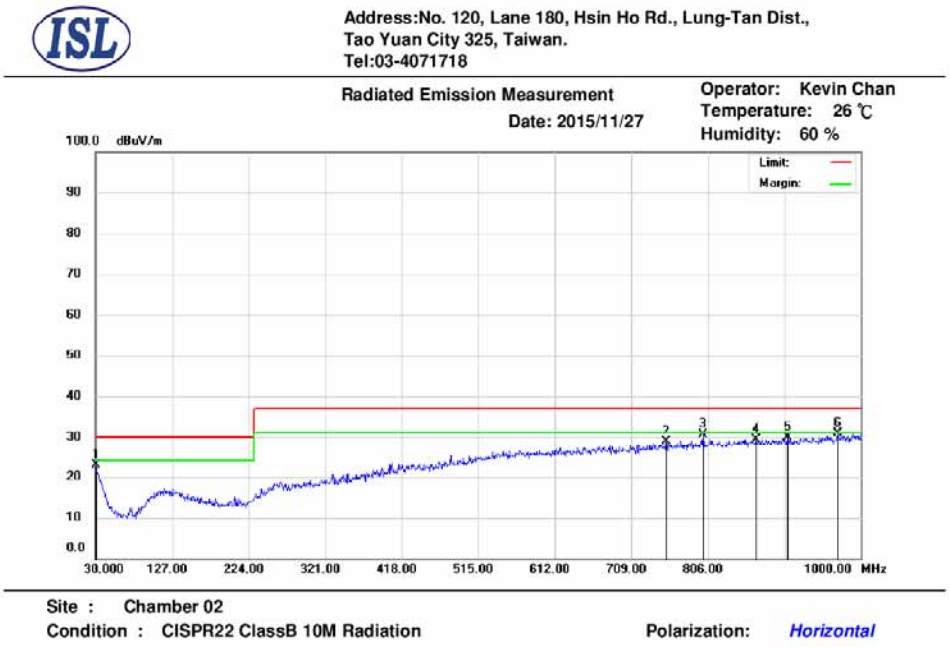
The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

### 3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

| | |
|---|---|
| Frequency Range: | 30MHz--1000MHz |
| Detector Function: | Quasi-Peak Mode |
| Resolution Bandwidth: | 120KHz |
| Frequency Range: | Above 1000MHz |
| Detector Function: | Peak/Average Mode |
| Resolution Bandwidth: | 1MHz |

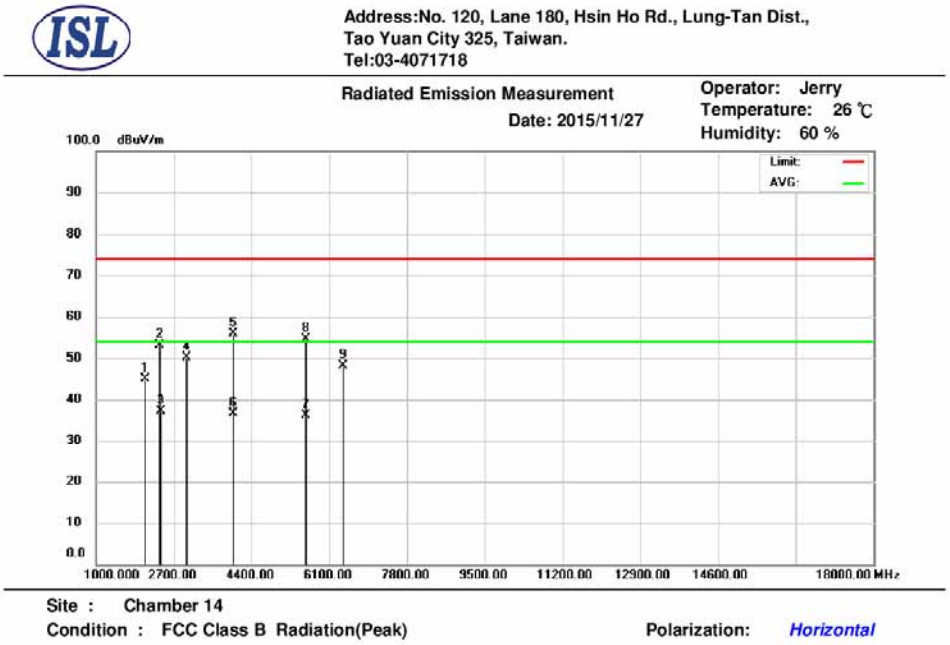
## 3.2 Radiation Test Data: Configuration 1

### Table 3.2.1 Radiated Emissions (Horizontal)




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 2.98 | 19.93 | 22.91 | 30.00 | -7.09 | 136 | 332 | QP |
| 2 | 753.62 | 3.75 | 25.06 | 28.81 | 37.00 | -8.19 | 349 | 340 | QP |
| 3 | 800.18 | 5.32 | 25.31 | 30.63 | 37.00 | -6.37 | 167 | 37 | QP |
| 4 | 867.11 | 3.35 | 26.04 | 29.39 | 37.00 | -7.61 | 115 | 341 | QP |
| 5 | 906.88 | 3.54 | 26.35 | 29.89 | 37.00 | -7.11 | 315 | 185 | QP |
| 6 | 970.90 | 3.92 | 27.05 | 30.97 | 37.00 | -6.03 | 301 | 240 | QP |

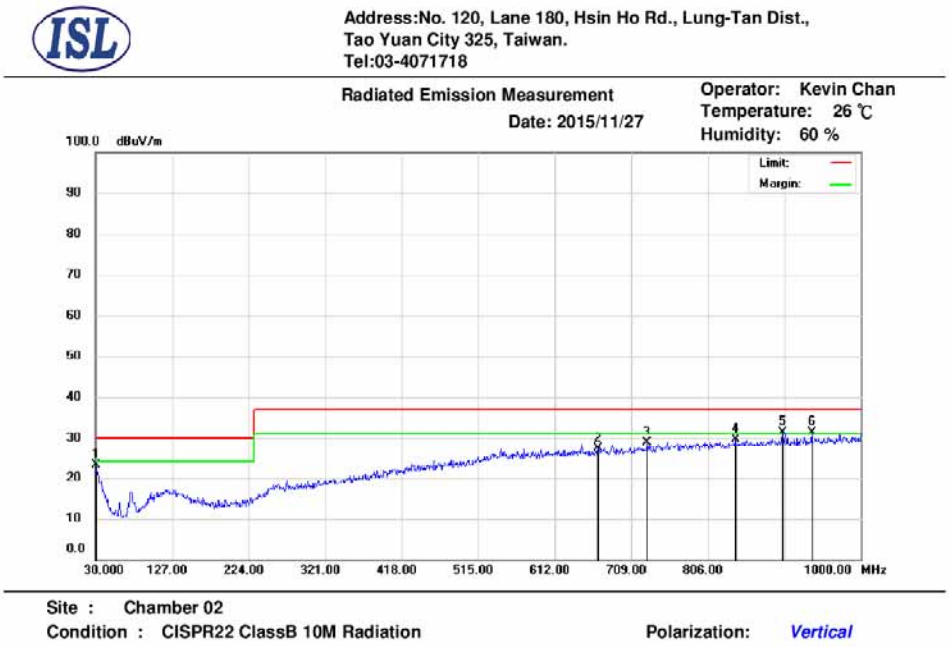
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2071.00 | 56.75 | -11.84 | 44.91 | 74.00 | -29.09 | 217 | 223 | peak |
| 2 | 2394.00 | 64.53 | -11.45 | 53.08 | 74.00 | -20.92 | 100 | 73 | peak |
| 3 | 2400.00 | 48.64 | -11.43 | 37.21 | 54.00 | -16.79 | 182 | 322 | AVG |
| 4 | 2989.00 | 60.08 | -10.03 | 50.05 | 74.00 | -23.95 | 100 | 36 | peak |
| 5 | 3987.00 | 64.41 | -8.57 | 55.84 | 74.00 | -18.16 | 100 | 196 | peak |
| 6 | 3988.70 | 45.23 | -8.55 | 36.68 | 54.00 | -17.32 | 176 | 225 | AVG |
| 7 | 5583.15 | 44.48 | -8.28 | 36.20 | 54.00 | -17.80 | 134 | 14 | AVG |
| 8 | 5590.00 | 62.97 | -8.28 | 54.69 | 74.00 | -19.31 | 387 | 351 | peak |
| 9 | 6406.00 | 54.63 | -6.52 | 48.11 | 74.00 | -25.89 | 185 | 295 | peak |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.**
**No signal can be detected from 18GHz to 30GHz, so the graphs are omitted above 18GHz.**

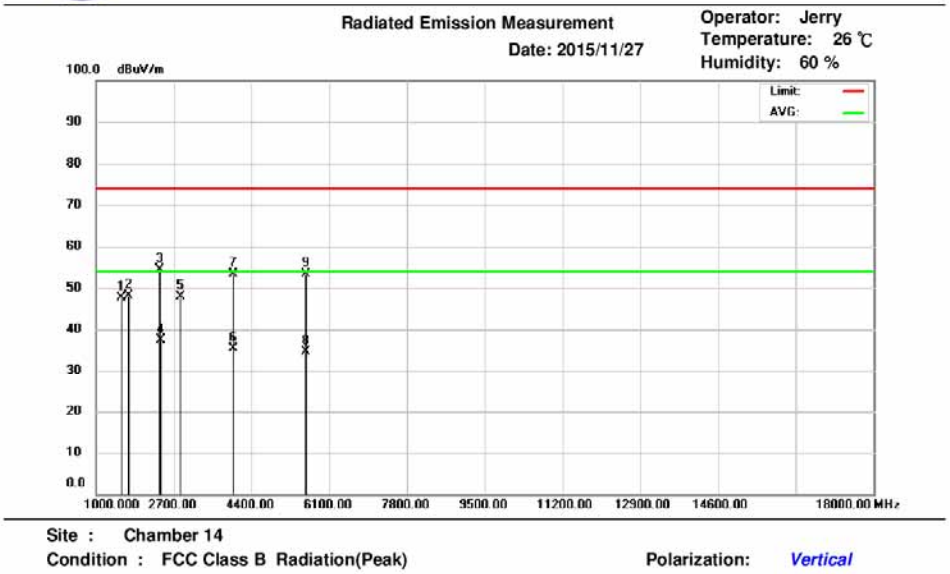
## Table 3.2.2 Radiated Emissions (Vertical)




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 3.26 | 19.93 | 23.19 | 30.00 | -6.81 | 102 | 218 | QP |
| 2 | 666.32 | 3.52 | 23.89 | 27.41 | 37.00 | -9.59 | 298 | 139 | QP |
| 3 | 729.37 | 4.20 | 24.62 | 28.82 | 37.00 | -8.18 | 100 | 1 | QP |
| 4 | 840.92 | 3.82 | 25.80 | 29.62 | 37.00 | -7.38 | 100 | 296 | QP |
| 5 | 901.06 | 4.98 | 26.30 | 31.28 | 37.00 | -5.72 | 100 | 184 | QP |
| 6 | 937.92 | 4.73 | 26.65 | 31.38 | 37.00 | -5.62 | 100 | 344 | QP |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718



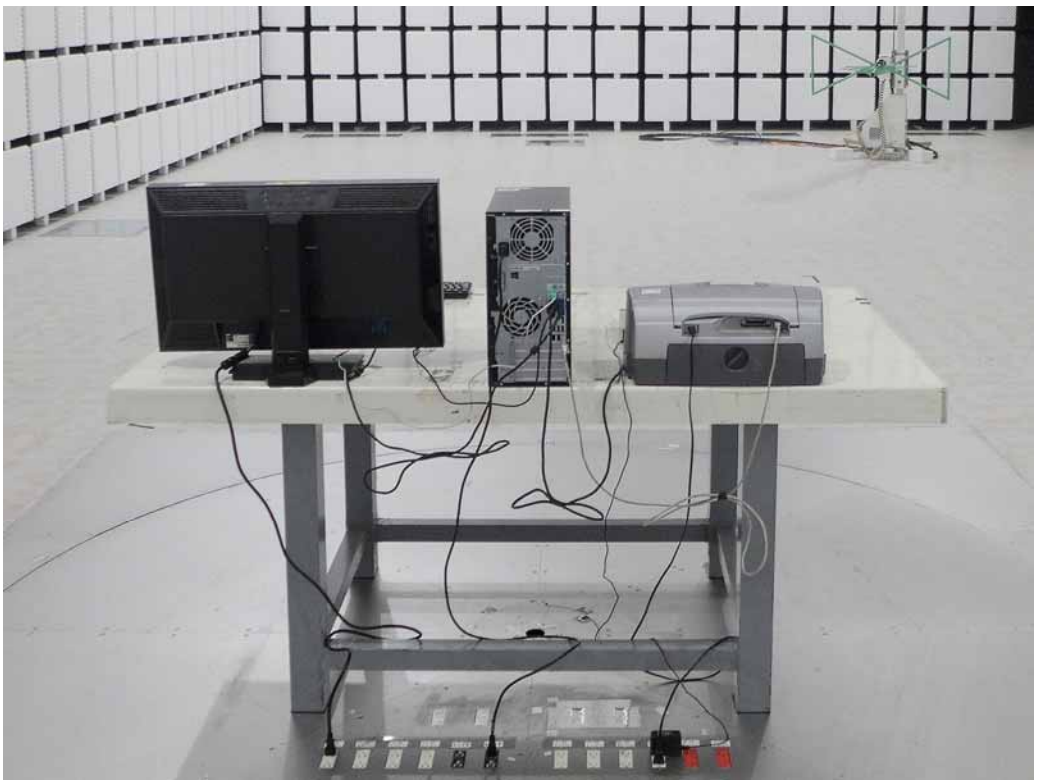

| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1561.00 | 63.15 | -15.59 | 47.56 | 74.00 | -26.44 | 135 | 290 | peak |
| 2 | 1714.00 | 62.59 | -14.50 | 48.09 | 74.00 | -25.91 | 272 | 340 | peak |
| 3 | 2394.00 | 65.76 | -11.45 | 54.31 | 74.00 | -19.69 | 224 | 233 | peak |
| 4 | 2400.05 | 48.72 | -11.43 | 37.29 | 54.00 | -16.71 | 138 | 12 | AVG |
| 5 | 2836.00 | 58.16 | -10.34 | 47.82 | 74.00 | -26.18 | 210 | 7 | peak |
| 6 | 3985.00 | 43.88 | -8.57 | 35.31 | 54.00 | -18.69 | 157 | 16 | AVG |
| 7 | 3992.00 | 62.02 | -8.56 | 53.46 | 74.00 | -20.54 | 185 | 30 | peak |
| 8 | 5588.45 | 42.95 | -8.28 | 34.67 | 54.00 | -19.33 | 100 | 0 | AVG |
| 9 | 5590.00 | 61.68 | -8.28 | 53.40 | 74.00 | -20.60 | 274 | 130 | peak |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.**
**No signal can be detected from 18GHz to 30GHz, so the graphs are omitted above 18GHz.**

### 3.3 Test Setup Photo

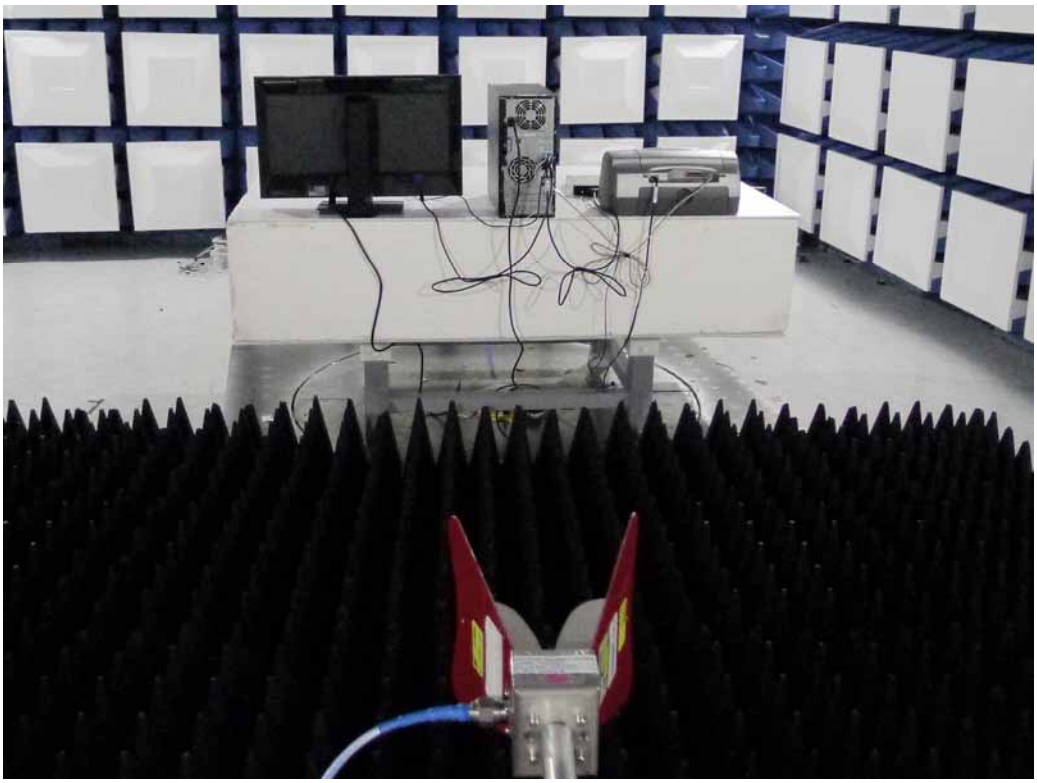
Front View (30MHz~1GHz)

Back View (30MHz~1GHz)



Front View (above 1GHz)

Back View (above 1GHz)



# 4. Appendix

## 4.1 Appendix A: Warning Labels

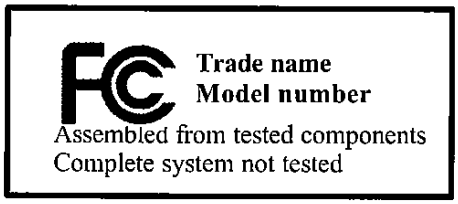
**Label Requirements**

A Class B digital device subject to Declaration of Conformity of FCC shall carry a label which includes the following statement:

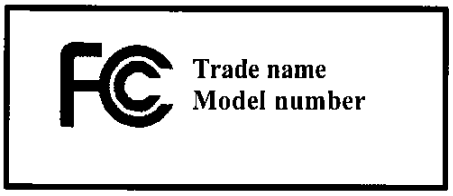
*** * * W A R N I N G * * ***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.




**4.2**



## 4.2 Appendix B: Warning Statement

**Statement Requirements**

The operators' manual for a Class B digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

* * * * * * * * * *

If the EUT was tested with special shielded cables the operators manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

## 4.3 Appendix C: Test Equipment

### 4.3.1 Test Equipment List

| Location Con02 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Conduction 02 | LISN 15 | R&S | ENV216 | 101335 | 09/18/2015 | 09/18/2016 |
| Conduction 02 | LISN 06 | ROHDE&SCHWARZ | ESH3/Z5 | 828874/009 | 03/26/2015 | 03/26/2016 |
| Conduction 02 | Conduction 02-1 Cable | WOKEN | CFD 300-NL | Conduction 02 -1 | 07/17/2015 | 07/17/2016 |
| Conduction 02 | EMI Receiver 14 | ROHDE& SCHWARZ | ESCI | 101034 | 06/04/2015 | 06/04/2016 |

| Location Chamber02 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Radiation (Chamber02) | BILOG Antenna 15 | Teseq GmbH | CBL6112D | 27622 | 01/29/2015 | 01/29/2016 |
| Radiation (Chamber02) | Coaxial Cable Chmb 02-10M-02 | MIYAZAK | 8D-FB | Chmb 02-10M-02 | 10/02/2015 | 10/02/2016 |
| Radiation (Chamber02) | EMI Receiver 12 | ROHDE & SCHWARZ | ESCI | 100804 | 08/06/2015 | 08/06/2016 |

| Location Chmb14 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Rad. Above 1GHz | Spectrum Analyzer 24 (1G~26.5GHz) | Agilent | N9010A | MY49060537 | 07/30/2015 | 07/30/2016 |
| Rad. Above 1GHz | Horn Antenna 06 (1G~18G) | ETS | 3117 | 00066665 | 11/30/2015 | 11/30/2016 |
| Rad. Above 1GHz | Preamplifier 13 (1G-18G) | MITEQ | JS44-00101800-25-10P-44 | 1329256 | 07/28/2015 | 07/28/2016 |
| Rad. Above 1GHz | Microwave Cable 25 (1G-18G) | EMC Instruments | EMC104-NM-SM-6000 | 141111 | 11/25/2015 | 11/25/2016 |
| Rad. Above 1GHz | Microwave Cable 26 (1G-18G) | EMC Instruments | EMC104-NM-SM-800 | 141112 | 11/25/2015 | 11/25/2016 |

### 4.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

| Site | Filename | Version | Issue Date |
|---|---|---|---|
| Conduction/Radiation | EZ EMC | ISL-03A2 | 3/6/2013 |

## 4.4 Appendix D: Uncertainty of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2011. The coverage factor k = 2 yields approximately a 95 % level of confidence.

<Conduction 02>
AMN: ±2.88dB

<Chamber 02 (10M)>
Horizontal
30MHz~200MHz: ±4.38dB
200MHz~1000MHz: ±4.12dB
Vertical
30MHz~200MHz: ±4.57dB
200MHz~1000MHz: ±4.10dB

<Chamber 14 (3M)>
1GHz~18GHz: ±4.38dB

## 4.5 Appendix E: Photographs of EUT

Please refer to the File of **ISL-*15LE597*P-MB**

# Declaration of Conformity

This device complies with Part 15 of the FCC Rules. The test result has been shown in the ISL test report with number ISL-15LE597FB-MB. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

| | |
|---|---|
| Product Name: | PHANES-HR 2.5" SATA III SSD |
| Model(s): | 7SR |
| Brand: | APRO |
| Name of Responsible Party: | APRO CO., LTD. |
| Address of Responsible Party: | 11F-5, No.738, Zongzheng Rd., Zonghe Dist. New Taipei City, 23511 Taiwan. |

*We, APRO CO., LTD., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable FCC Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the Commissions requirements.*

---
APRO CO., LTD.
**Issue Date: November 28, 2016**

# Certificate

Issue Date: November 28, 2016
Ref. Report No. ISL-15LE597FB-MB

| | | |
|---|---|---|
| Product Name | : | PHANES-HR 2.5” SATA III SSD |
| Model(s) | : | 7SR |
| Brand | : | APRO |
| Applicant | : | APRO CO., LTD. |
| Address | : | 11F-5, No.738, Zongzheng Rd., Zonghe Dist. New Taipei City, 23511 Taiwan. |

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance).

**Standards:**

FCC CFR Title 47 Part 15 Subpart B: 2014- Section 15.107 and 15.109
ANSI C63.4-2009
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012

**Class B**

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**International Standards Laboratory**

W.H. Chang / Director

☐ **Hsi-Chih LAB**:
No. 65, Gu Dai Keng Street, Hsi-Chih Dist.,
New Taipei City 221, Taiwan
Tel: 886-2-2646-2550; Fax: 886-2-2646-4641

☒ **Lung-Tan LAB**:
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan
Tel: 886-3-407-1718; Fax: 886-3407-1738

# Declaration of Conformity

This device complies with Part 15 of the FCC Rules. The test result has been shown in the ISL test report with number ISL-15LE597FB-MB. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

| | |
|---|---|
| Product Name: | PHANES-HR 2.5" SATA III SSD |
| Model(s): | 7SR |
| Brand: | APRO |
| Name of Responsible Party: | APRO CO., LTD. |
| Address of Responsible Party: | 11F-5, No.738, Zongzheng Rd., Zonghe Dist. New Taipei City, 23511 Taiwan. |

*We, APRO CO., LTD., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable FCC Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the Commissions requirements.*

---
APRO CO., LTD.
**Issue Date: November 28, 2016**

# FCC TEST REPORT

of

# CFR 47 Part 15 Subpart B Class B

Application Type: Declaration of Conformity

Product : **PHANES-HR 2.5" SATA III SSD**

Model(s): **7SR**

Brand: **APRO**

Applicant: **APRO CO., LTD.**

Address: **11F-5, No.738, Zongzheng Rd., Zonghe Dist. New Taipei City, 23511 Taiwan.**

Test Performed by:

**International Standards Laboratory**

<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; SL2-R1/R2-E-0013; TAF: 0997
FCC: TW1036; IC: IC4067B-1; NEMKO: ELA 113B
VCCI: <Conduction 02>C-1440, T-1676, <Conduction 03>C-2845, T-1464, <Conduction 04>C-4778, T-2295, <Chamber 02>R-1435, G-17, <Chamber 12>R-2598, G-16, <Chamber 14>G-211,
*Address:
No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel: 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-15LE597FB-MB**

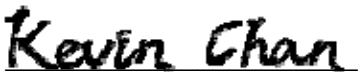
Issue Date : **November 28, 2016**

This report totally contains 24 pages including this cover page and contents page.

## Contents of Report

# 1. General

## 1.1 Certification of Accuracy of Test Data

| | |
|---|---|
| **Standards:** | FCC CFR Title 47 Part 15 Subpart B: 2014- Section 15.107 and 15.109<br>ANSI C63.4-2009<br>Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012 |
| **Equipment Tested:** | PHANES-HR 2.5" SATA III SSD |
| **Model:** | 7SR |
| **Brand:** | APRO |
| **Applicant:** | APRO CO., LTD. |
| **Sample received Date:** | November 27, 2015 |
| **Final test Date:** | refer to the date of test data |
| **Test Site:** | International Standards Laboratory<br>Chamber 02; Chamber 14; Conduction 02 |
| **Test Distance:** | 10M; 3M (above1GHz) |
| **Temperature:** | refer to each site test data |
| **Humidity:** | refer to each site test data |
| **Input power:** | Conduction input power: AC 120 V / 60 Hz<br>Radiation input power: AC 120 V / 60 Hz |
| **Test Result:** | **PASS** |
| **Report Engineer:** | Vivian Chang |
| **Test Engineer:** |  <br>Kevin Chan |
| **Approved By:** |  <br>W.H. Chang / Director |

### 1.2 Description of EUT

# EUT

| | |
|---|---|
| Description: | PHANES-HR 2.5" SATA III SSD |
| Condition: | Pre-Production |
| Model: | 7SR |
| Serial Number: | N/A |
| Control IC: | PS3110-S10 |
| Power: | From Personal Computer SATA port Supply |
| PCBA Number: | A085010MEG20001N |
| Memory Capacity: | 1GB ~ 512GB |
| Highest working frequency: | 6GHz |
| The radiation test should be tested till 30GHz | |

**Exterior Model Difference:**

| Configuration | Exterior | Control IC | Memory Capacity |
|---|---|---|---|
| 1 | Rectangular | PS3110-S10 | 512GB |
| 2 | Arcuate | PS3110-S10 | 512GB |

**The memory capacities listed below is chosen by the applicant to be the representative configuration for testing in this report.**
**For test configurations:**

| Configuration | Exterior | Control IC | Memory Capacity |
|---|---|---|---|
| 1 | Rectangular | PS3110-S10 | 512GB |

**EMI Noise Source:**

| Refer to the photo | Control IC | Point |
|---|---|---|
| EUT-9 | 30MHz | U1 |

**EMI Noise Source:**
N/A

## 1.3 Description of Support Equipment

| No | Unit | Model / Serial No. | Brand | Power Cord | FCC ID |
|---|---|---|---|---|---|
| 1 | Personal Computer | DX7400 S/N: N/A | HP | Non-shielded | FCC DOC |
| 2 | PS/2 Keyboard | Y-S0002 S/N: N/A | Logitch | N/A | FCC DOC |
| 3 | PS/2 Mouse | M-SBM96B S/N: NA | Logitch | N/A | FCC DOC |
| 4 | HP Printer | C930 S/N: N/A | HP | Non-shielded | FCC DOC |
| 5 | Aceex Modem | DM1414 S/N: N/A | Aceex | Non-shielded | FCC DOC |
| 6 | 27" LCD Monitor | B273HU S/N: NA | acer | Non-shielded | FCC DOC |

## 1.4 Software for Controlling Support Unit

**Test programs exercising various part of EUT were used. The programs were executed as follows:**

**Test configuration:**

1. PC running Winthrax to read and write the EUT.
2. Send signal to the Printer through PC Parallel Port.
3. Send signal to the Modem through PC Serial Port.
4. Send H pattern to the LCD Monitor through PC D-SUB Port.
5. Repeat the above steps.

| | Filename | Issued Date |
|---|---|---|
| EUT | Winthrax | 06/04/2005 |
| Printer | IntelEMC.exe | 04/11/2007 |
| Modem | IntelEMC.exe | 04/11/2007 |
| Monitor | IntelEMC.exe | 04/11/2007 |

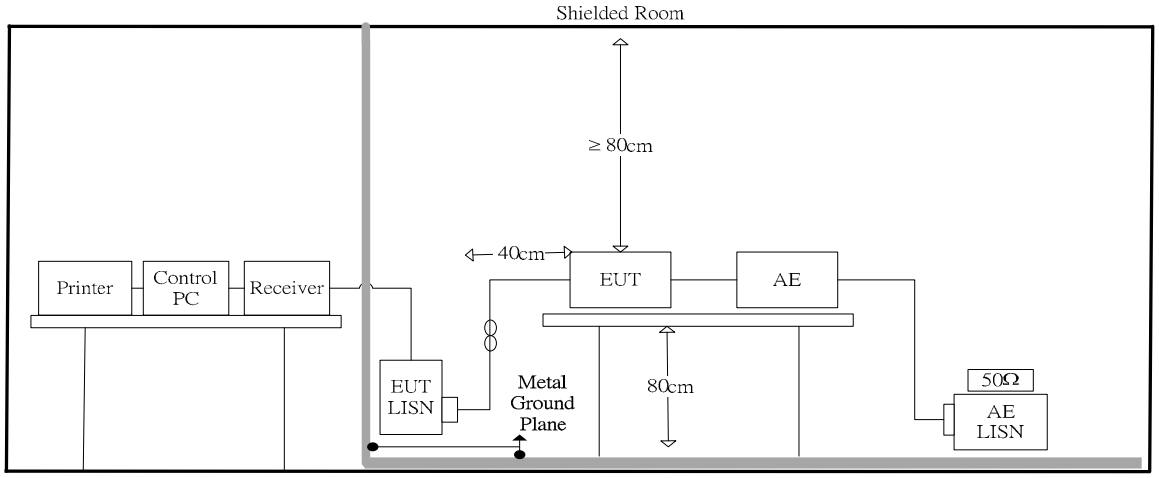
## 1.5 I/O Cable Condition of EUT and Support Units

| Description | Path | Cable Length | Cable Type |
|---|---|---|---|
| AC Power Cable | 110V (~240V) to PC SPS | 1.8m | Non-shielded |
| PS/2 Keyboard Data Cable | PS/2 Keyboard to PC PS/2 Keyboard Port | 1.8m | Shielded |
| PS/2Mouse Data Cable | PS/2Mouse to PC PS/2 Mouse Port | 1.8m | Shielded |
| Printer Data Cable | Printer to PC Parallel Port | 1.8m | Shielded |
| Modem Data Cable | Modem to PC Serial Port | 1.8m | Shielded |
| Monitor Data Cable | Monitor D-SUB Port to PC D-SUB Port | 1.8m | Shielded (with core) |

# 2. Powerline Conducted Emissions

## 2.1 Test Setup and Procedure

### 2.1.1 Test Setup




### 2.1.2 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to ANSI C63.4 requirements.

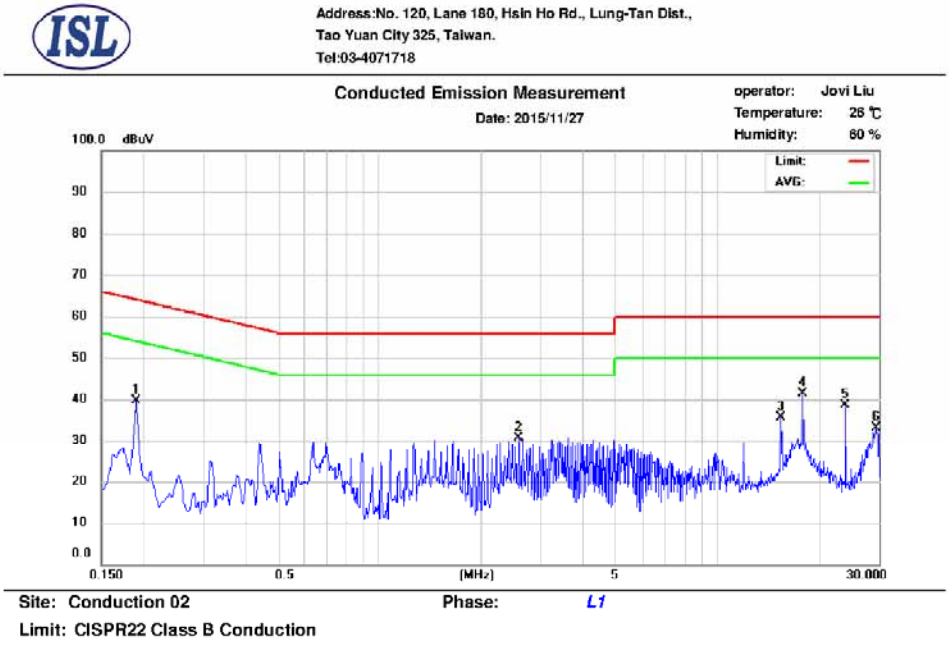
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

### 2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

| | |
|---|---|
| Frequency Range: | 150KHz~30MHz |
| Detector Function: | Quasi-Peak / Average Mode |
| Resolution Bandwidth: | 9KHz |

## 2.2 Conduction Test Data: Configuration 1

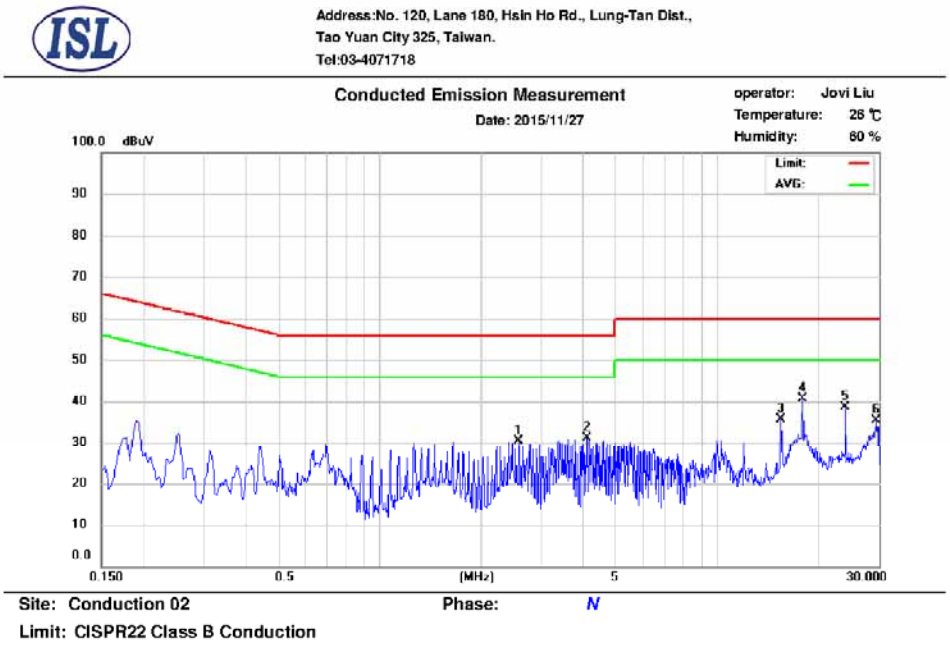
### Table 2.2.1 Power Line Conducted Emissions (Line)




| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.190 | 25.78 | 19.23 | 9.65 | 35.43 | 64.04 | -28.61 | 28.88 | 54.04 | -25.16 |
| 2 | 2.594 | 19.74 | 17.36 | 9.73 | 29.47 | 56.00 | -26.53 | 27.09 | 46.00 | -18.91 |
| 3 | 15.450 | 23.71 | 22.38 | 9.96 | 33.67 | 60.00 | -26.33 | 32.34 | 50.00 | -17.66 |
| 4 | 17.922 | 29.24 | 29.15 | 10.00 | 39.24 | 60.00 | -20.76 | 39.15 | 50.00 | -10.85 |
| 5 | 23.898 | 27.68 | 27.83 | 10.02 | 37.70 | 60.00 | -22.30 | 37.85 | 50.00 | -12.15 |
| 6 | 29.466 | 19.27 | 8.76 | 10.02 | 29.29 | 60.00 | -30.71 | 18.78 | 50.00 | -31.22 |

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
**The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.**
**If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.**
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**

## Table 2.2.2 Power Line Conducted Emissions (Neutral)




| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.594 | 19.14 | 16.72 | 9.71 | 28.85 | 56.00 | -27.15 | 26.43 | 46.00 | -19.57 |
| 2 | 4.110 | 17.67 | 14.55 | 9.75 | 27.42 | 56.00 | -28.58 | 24.30 | 46.00 | -21.70 |
| 3 | 15.450 | 23.65 | 22.31 | 10.03 | 33.68 | 60.00 | -26.32 | 32.34 | 50.00 | -17.66 |
| 4 | 17.922 | 28.93 | 28.75 | 10.09 | 39.02 | 60.00 | -20.98 | 38.84 | 50.00 | -11.16 |
| 5 | 23.898 | 28.18 | 28.22 | 10.14 | 38.32 | 60.00 | -21.68 | 38.36 | 50.00 | -11.64 |
| 6 | 29.610 | 16.14 | 8.18 | 10.16 | 26.30 | 60.00 | -33.70 | 18.34 | 50.00 | -31.66 |

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
**The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.**
**If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.**
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**

## 2.3 Test Setup Photo

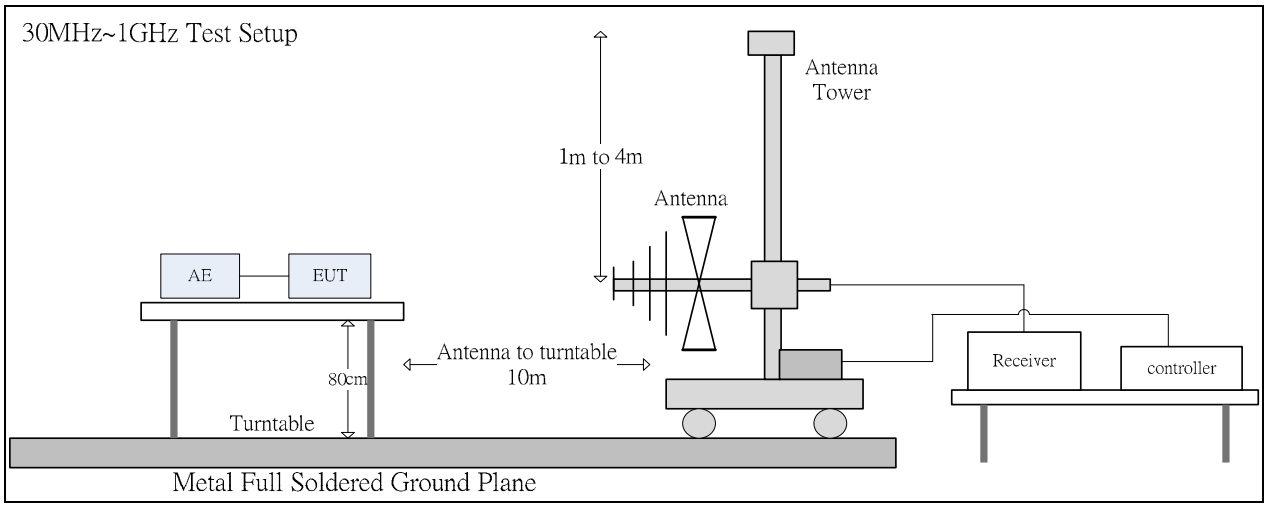
Front View

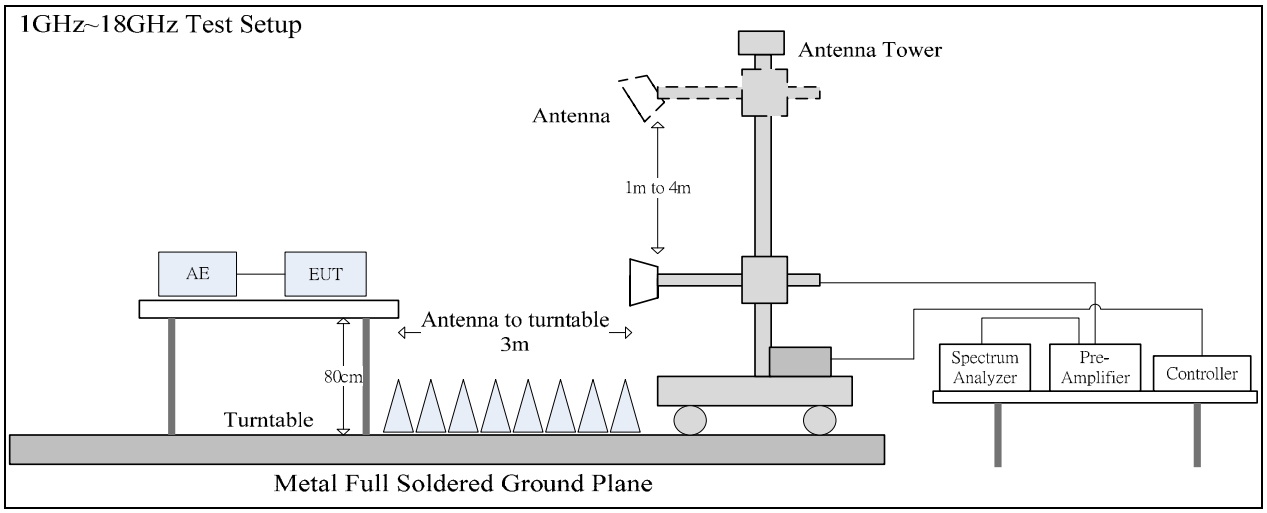
Back View

# 3. Radiated Emissions

## 3.1 Test Setup and Procedure

### 3.1.1 Test Setup



### 3.1.2 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites or 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 40 GHz were analyzed in details by operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the cone of radiation from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to ANSI C63.4 requirements.

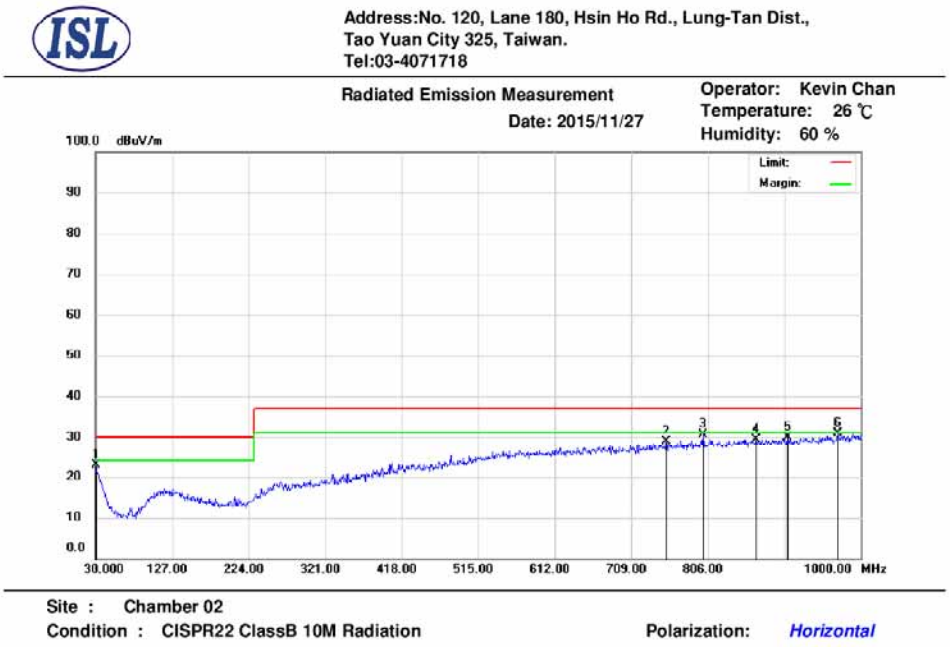
The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

### 3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

| | |
|---|---|
| Frequency Range: | 30MHz--1000MHz |
| Detector Function: | Quasi-Peak Mode |
| Resolution Bandwidth: | 120KHz |
| Frequency Range: | Above 1000MHz |
| Detector Function: | Peak/Average Mode |
| Resolution Bandwidth: | 1MHz |

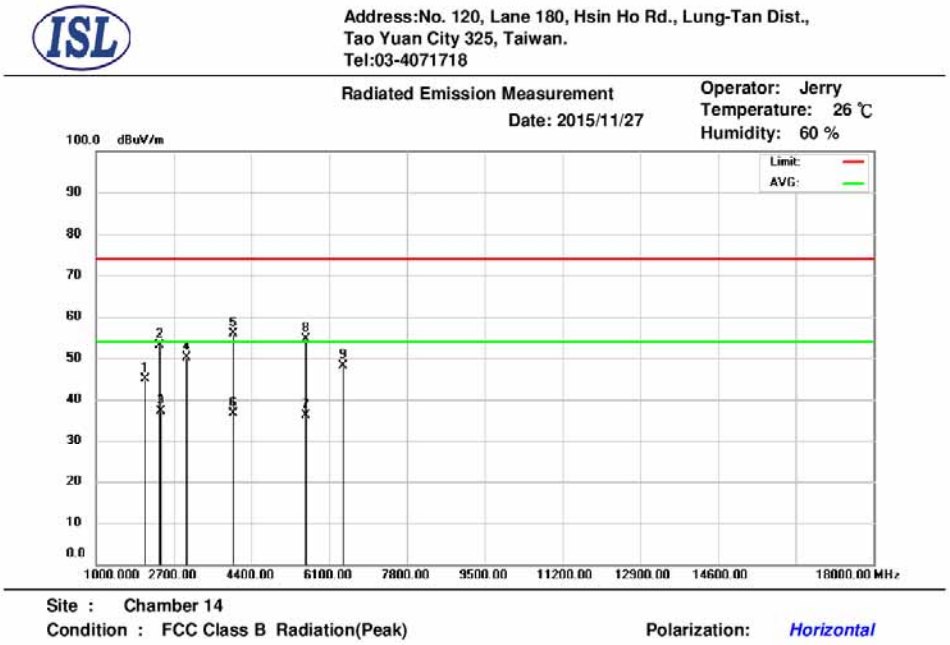
## 3.2 Radiation Test Data: Configuration 1

### Table 3.2.1 Radiated Emissions (Horizontal)




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 2.98 | 19.93 | 22.91 | 30.00 | -7.09 | 136 | 332 | QP |
| 2 | 753.62 | 3.75 | 25.06 | 28.81 | 37.00 | -8.19 | 349 | 340 | QP |
| 3 | 800.18 | 5.32 | 25.31 | 30.63 | 37.00 | -6.37 | 167 | 37 | QP |
| 4 | 867.11 | 3.35 | 26.04 | 29.39 | 37.00 | -7.61 | 115 | 341 | QP |
| 5 | 906.88 | 3.54 | 26.35 | 29.89 | 37.00 | -7.11 | 315 | 185 | QP |
| 6 | 970.90 | 3.92 | 27.05 | 30.97 | 37.00 | -6.03 | 301 | 240 | QP |

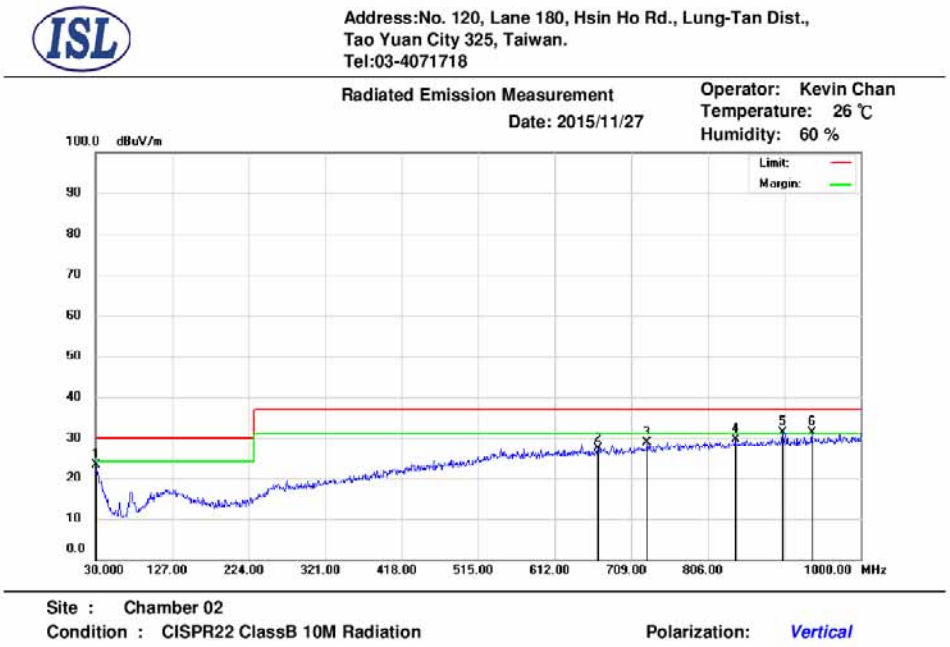
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2071.00 | 56.75 | -11.84 | 44.91 | 74.00 | -29.09 | 217 | 223 | peak |
| 2 | 2394.00 | 64.53 | -11.45 | 53.08 | 74.00 | -20.92 | 100 | 73 | peak |
| 3 | 2400.00 | 48.64 | -11.43 | 37.21 | 54.00 | -16.79 | 182 | 322 | AVG |
| 4 | 2989.00 | 60.08 | -10.03 | 50.05 | 74.00 | -23.95 | 100 | 36 | peak |
| 5 | 3987.00 | 64.41 | -8.57 | 55.84 | 74.00 | -18.16 | 100 | 196 | peak |
| 6 | 3988.70 | 45.23 | -8.55 | 36.68 | 54.00 | -17.32 | 176 | 225 | AVG |
| 7 | 5583.15 | 44.48 | -8.28 | 36.20 | 54.00 | -17.80 | 134 | 14 | AVG |
| 8 | 5590.00 | 62.97 | -8.28 | 54.69 | 74.00 | -19.31 | 387 | 351 | peak |
| 9 | 6406.00 | 54.63 | -6.52 | 48.11 | 74.00 | -25.89 | 185 | 295 | peak |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.**
**No signal can be detected from 18GHz to 30GHz, so the graphs are omitted above 18GHz.**

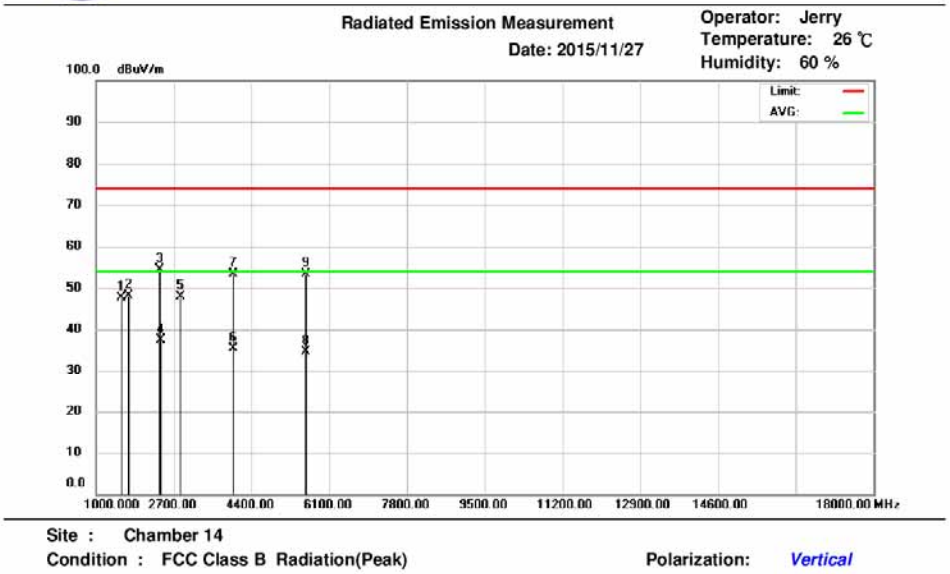
## Table 3.2.2 Radiated Emissions (Vertical)




| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 3.26 | 19.93 | 23.19 | 30.00 | -6.81 | 102 | 218 | QP |
| 2 | 666.32 | 3.52 | 23.89 | 27.41 | 37.00 | -9.59 | 298 | 139 | QP |
| 3 | 729.37 | 4.20 | 24.62 | 28.82 | 37.00 | -8.18 | 100 | 1 | QP |
| 4 | 840.92 | 3.82 | 25.80 | 29.62 | 37.00 | -7.38 | 100 | 296 | QP |
| 5 | 901.06 | 4.98 | 26.30 | 31.28 | 37.00 | -5.72 | 100 | 184 | QP |
| 6 | 937.92 | 4.73 | 26.65 | 31.38 | 37.00 | -5.62 | 100 | 344 | QP |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718



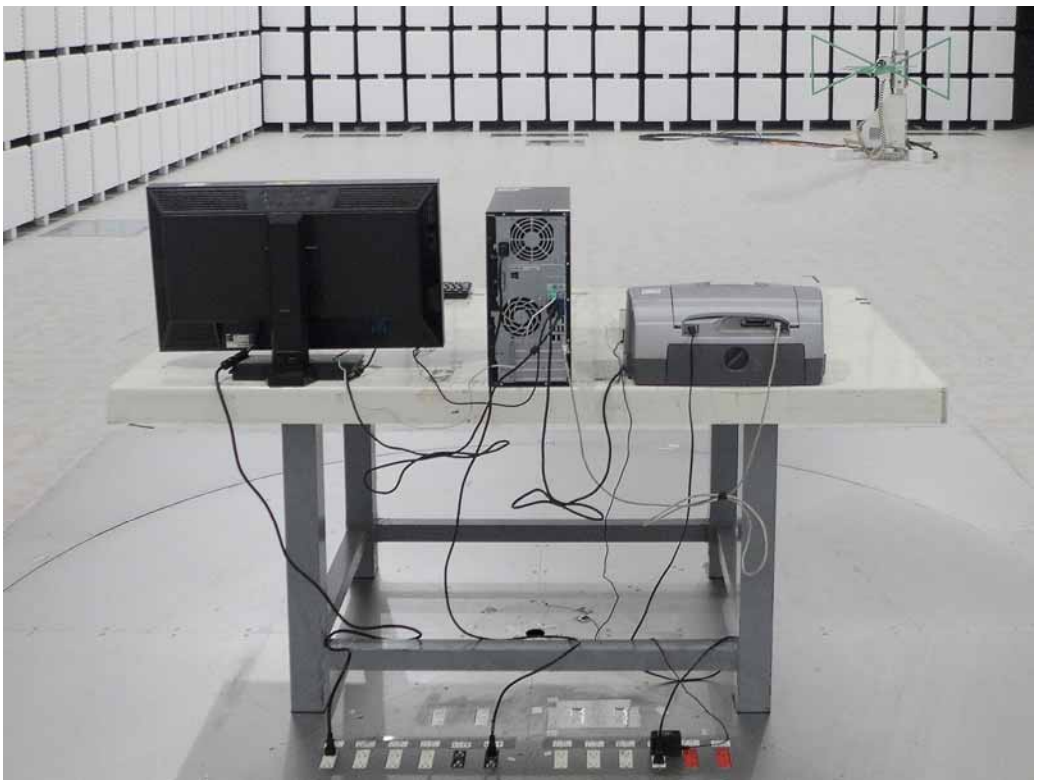

| Mk. | Frequency (MHz) | RX_R (dBuV) | Correct Factor(dB/m) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Ant.Pos (cm) | Tab.Pos (deg.) | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1561.00 | 63.15 | -15.59 | 47.56 | 74.00 | -26.44 | 135 | 290 | peak |
| 2 | 1714.00 | 62.59 | -14.50 | 48.09 | 74.00 | -25.91 | 272 | 340 | peak |
| 3 | 2394.00 | 65.76 | -11.45 | 54.31 | 74.00 | -19.69 | 224 | 233 | peak |
| 4 | 2400.05 | 48.72 | -11.43 | 37.29 | 54.00 | -16.71 | 138 | 12 | AVG |
| 5 | 2836.00 | 58.16 | -10.34 | 47.82 | 74.00 | -26.18 | 210 | 7 | peak |
| 6 | 3985.00 | 43.88 | -8.57 | 35.31 | 54.00 | -18.69 | 157 | 16 | AVG |
| 7 | 3992.00 | 62.02 | -8.56 | 53.46 | 74.00 | -20.54 | 185 | 30 | peak |
| 8 | 5588.45 | 42.95 | -8.28 | 34.67 | 54.00 | -19.33 | 100 | 0 | AVG |
| 9 | 5590.00 | 61.68 | -8.28 | 53.40 | 74.00 | -20.60 | 274 | 130 | peak |

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
**The CISPR 22 limits would be applied to all FCC Part 15 devices.**
**Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.**
**No signal can be detected from 18GHz to 30GHz, so the graphs are omitted above 18GHz.**

### 3.3 Test Setup Photo

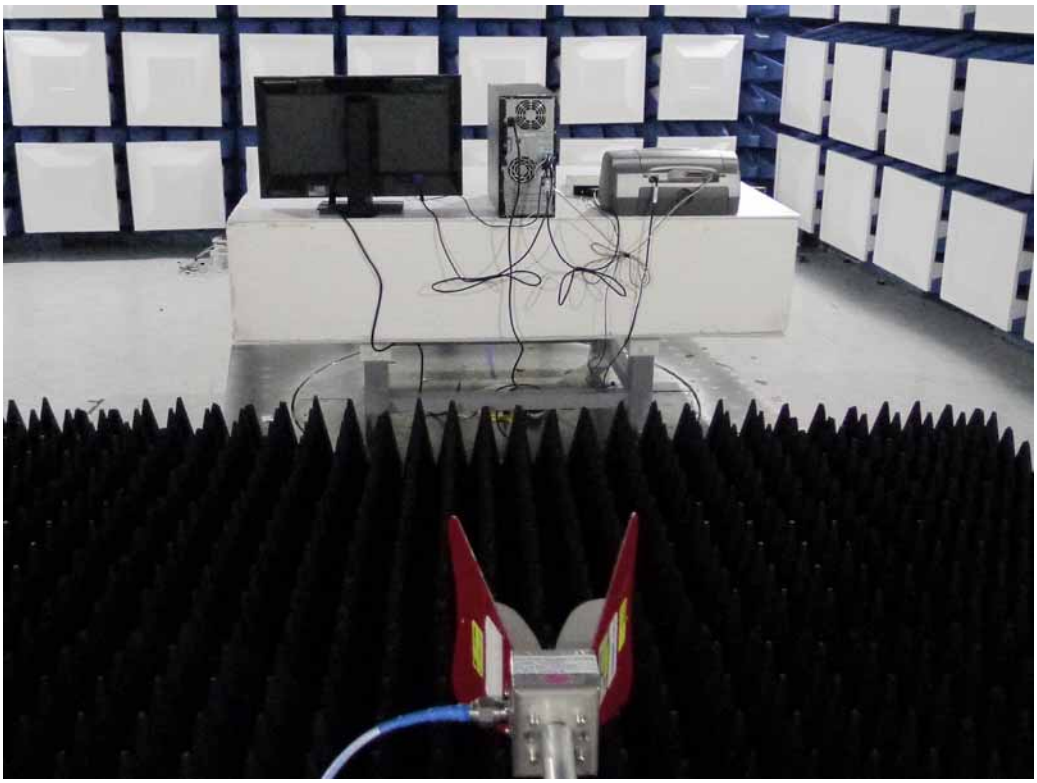
Front View (30MHz~1GHz)

Back View (30MHz~1GHz)



Front View (above 1GHz)

Back View (above 1GHz)



# 4. Appendix

## 4.1 Appendix A: Warning Labels

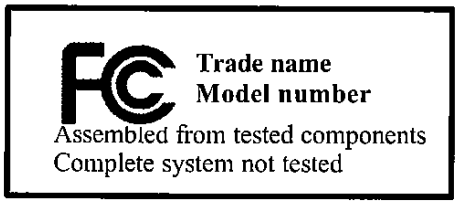
**Label Requirements**

A Class B digital device subject to Declaration of Conformity of FCC shall carry a label which includes the following statement:

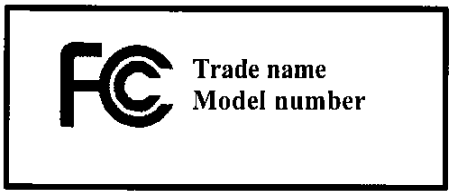
*** * * W A R N I N G * * ***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.




**4.2**



## 4.2 Appendix B: Warning Statement

**Statement Requirements**

The operators' manual for a Class B digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

* * * * * * * * * *

If the EUT was tested with special shielded cables the operators manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

## 4.3 Appendix C: Test Equipment

### 4.3.1 Test Equipment List

| Location Con02 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Conduction 02 | LISN 15 | R&S | ENV216 | 101335 | 09/18/2015 | 09/18/2016 |
| Conduction 02 | LISN 06 | ROHDE&SCHWARZ | ESH3/Z5 | 828874/009 | 03/26/2015 | 03/26/2016 |
| Conduction 02 | Conduction 02-1 Cable | WOKEN | CFD 300-NL | Conduction 02 -1 | 07/17/2015 | 07/17/2016 |
| Conduction 02 | EMI Receiver 14 | ROHDE& SCHWARZ | ESCI | 101034 | 06/04/2015 | 06/04/2016 |

| Location Chamber02 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Radiation (Chamber02) | BILOG Antenna 15 | Teseq GmbH | CBL6112D | 27622 | 01/29/2015 | 01/29/2016 |
| Radiation (Chamber02) | Coaxial Cable Chmb 02-10M-02 | MIYAZAK | 8D-FB | Chmb 02-10M-02 | 10/02/2015 | 10/02/2016 |
| Radiation (Chamber02) | EMI Receiver 12 | ROHDE & SCHWARZ | ESCI | 100804 | 08/06/2015 | 08/06/2016 |

| Location Chmb14 | Equipment Name | Brand | Model | S/N | Last Cal. Date | Next Cal. Date |
|---|---|---|---|---|---|---|
| Rad. Above 1GHz | Spectrum Analyzer 24 (1G~26.5GHz) | Agilent | N9010A | MY49060537 | 07/30/2015 | 07/30/2016 |
| Rad. Above 1GHz | Horn Antenna 06 (1G~18G) | ETS | 3117 | 00066665 | 11/30/2015 | 11/30/2016 |
| Rad. Above 1GHz | Preamplifier 13 (1G-18G) | MITEQ | JS44-00101800-25-10P-44 | 1329256 | 07/28/2015 | 07/28/2016 |
| Rad. Above 1GHz | Microwave Cable 25 (1G-18G) | EMC Instruments | EMC104-NM-SM-6000 | 141111 | 11/25/2015 | 11/25/2016 |
| Rad. Above 1GHz | Microwave Cable 26 (1G-18G) | EMC Instruments | EMC104-NM-SM-800 | 141112 | 11/25/2015 | 11/25/2016 |

### 4.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

| Site | Filename | Version | Issue Date |
|---|---|---|---|
| Conduction/Radiation | EZ EMC | ISL-03A2 | 3/6/2013 |

## 4.4 Appendix D: Uncertainty of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2011. The coverage factor k = 2 yields approximately a 95 % level of confidence.

<Conduction 02>
AMN: ±2.88dB

<Chamber 02 (10M)>
Horizontal
30MHz~200MHz: ±4.38dB
200MHz~1000MHz: ±4.12dB
Vertical
30MHz~200MHz: ±4.57dB
200MHz~1000MHz: ±4.10dB

<Chamber 14 (3M)>
1GHz~18GHz: ±4.38dB

## 4.5 Appendix E: Photographs of EUT

Please refer to the File of **ISL-*15LE597*P-MB**

# Appendix

# Photographs of EUT

*of*

*Product Name*

## PHANES-HR 2.5" SATA III SSD

*Model*

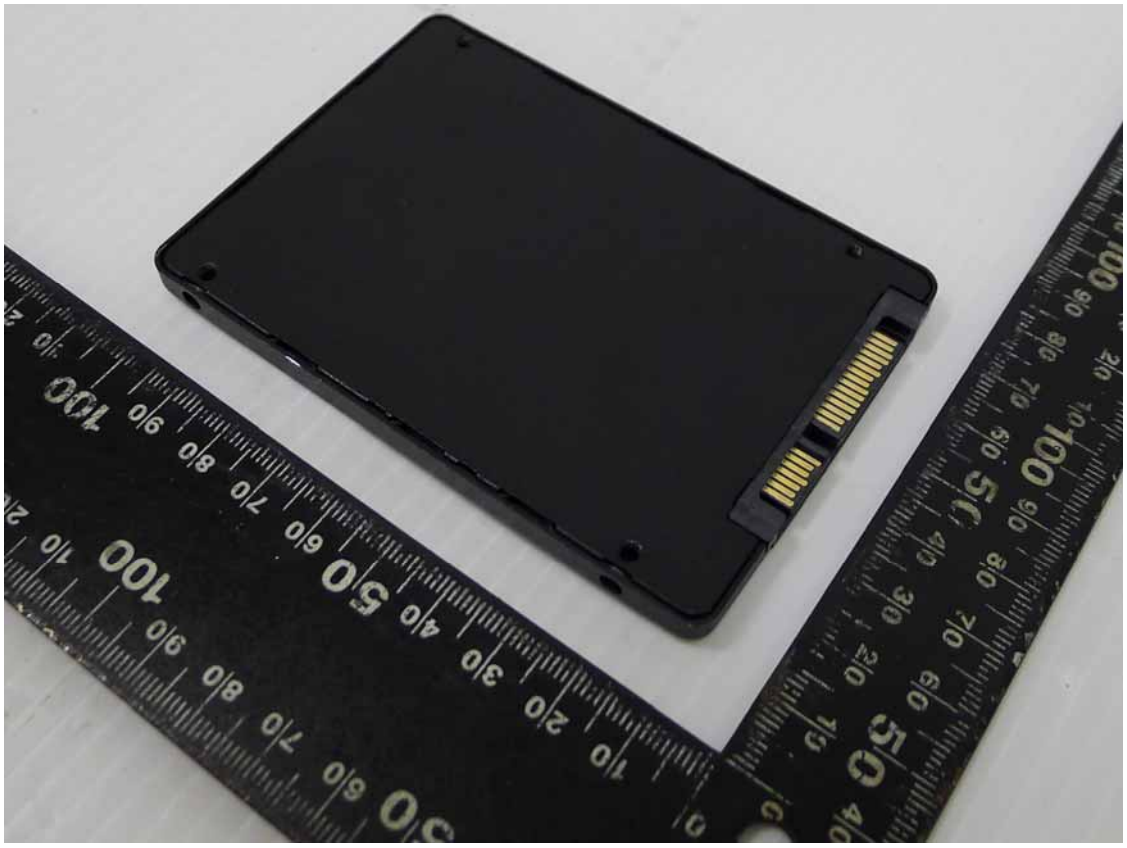
## 7SR

*Brand*

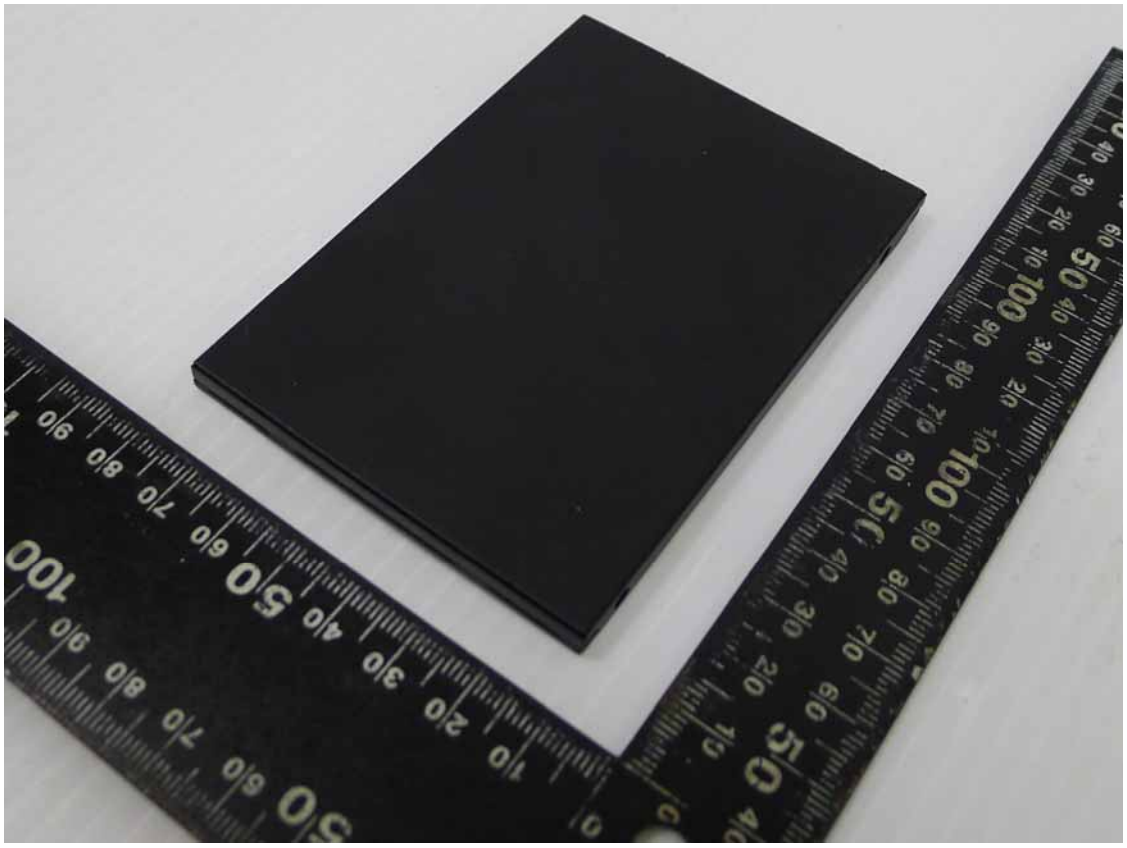
## APRO

EUT-1.

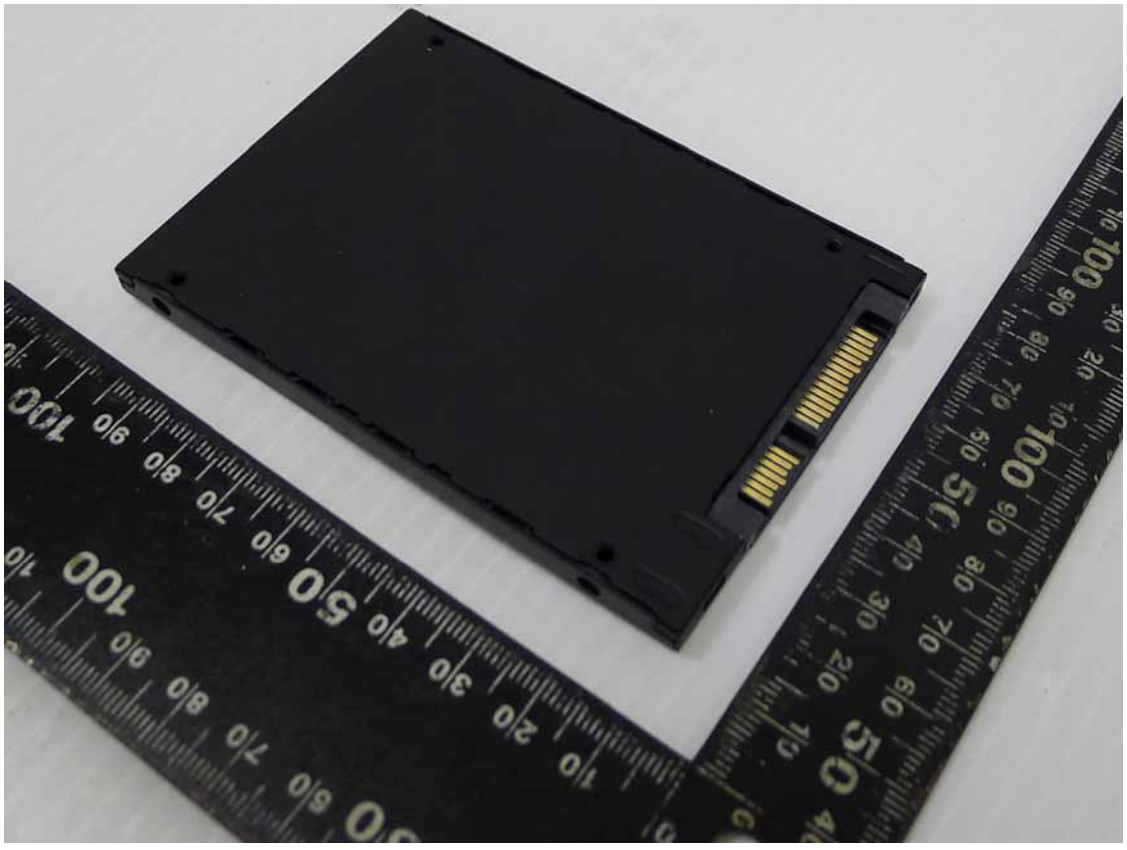
EUT-2.



EUT-3.

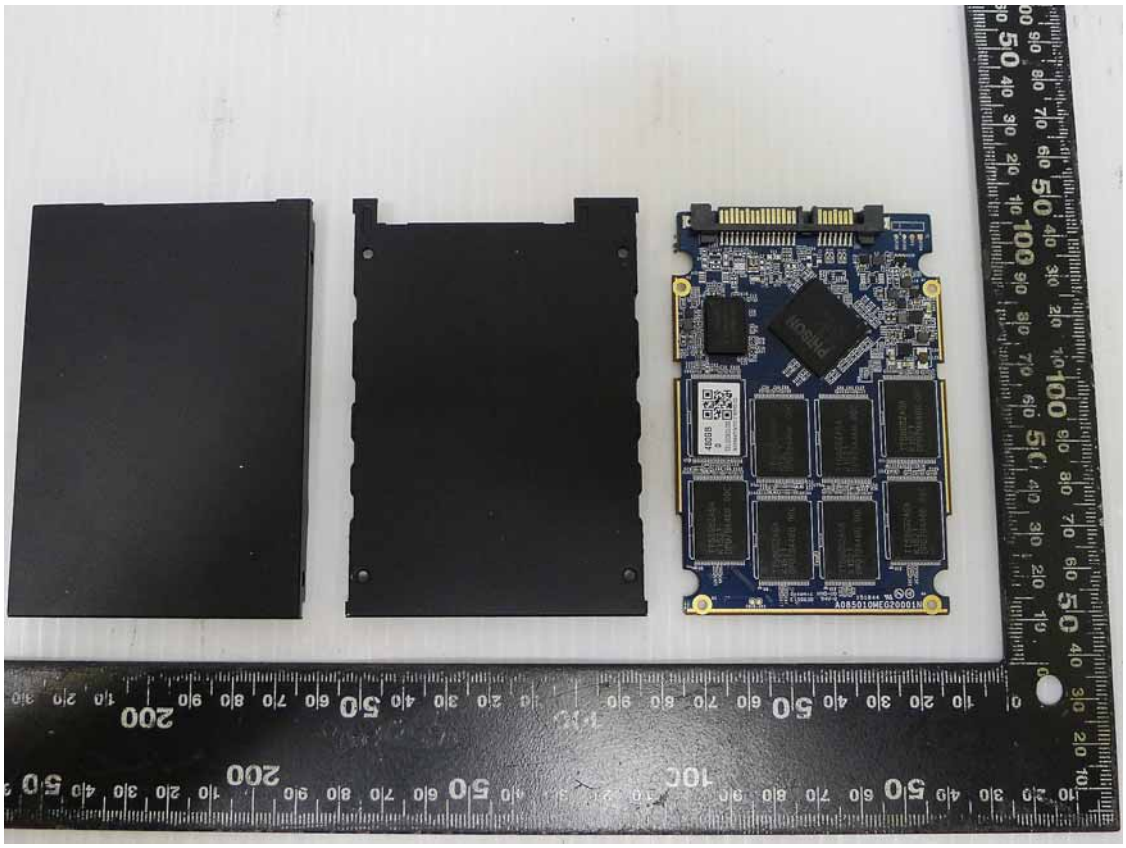


EUT-4.



EUT-5.

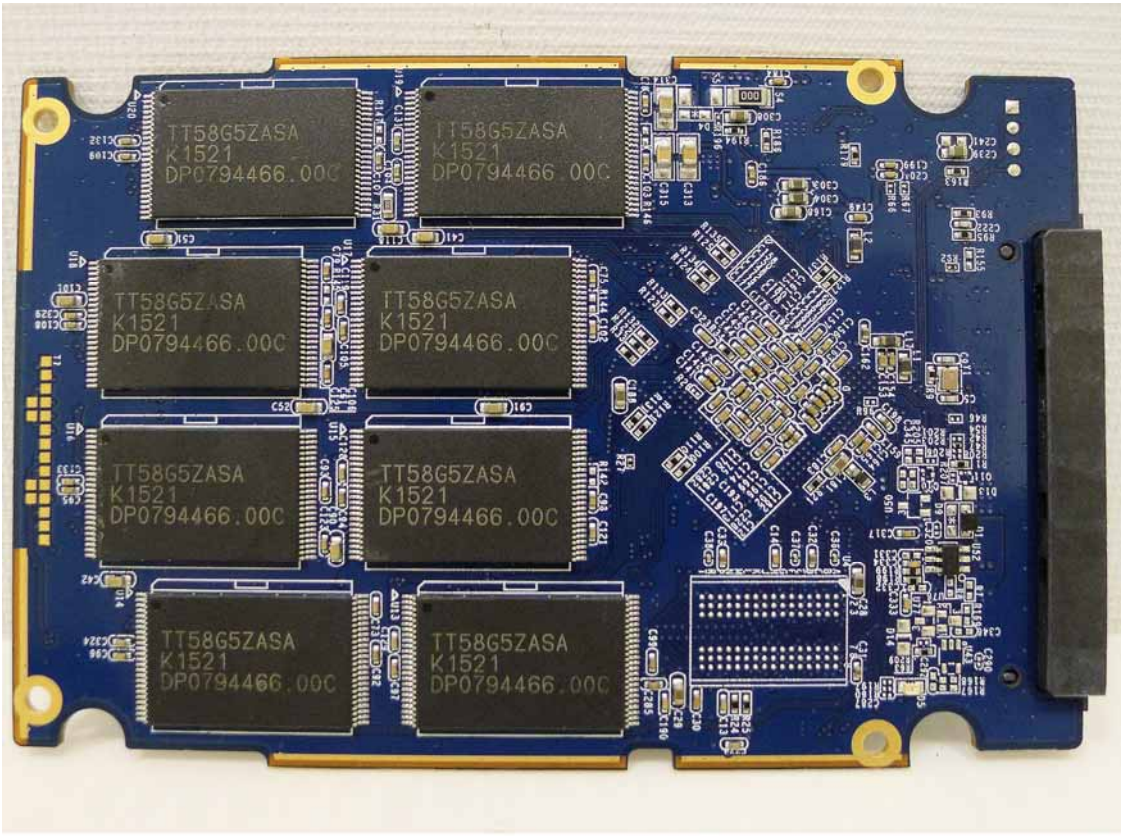
EUT-6.



EUT-7.


480GB
D
531-150611008
WARRANTY VOID IF REMOVED
TT58G5ZASA
K1521
DP0794466.00C
PHISON
PS3110-S10-X
A085010ME920001N

EUT-8.


TT58G5ZASA
K1521
DP0794466.00C

EUT-9.