

# Certificate

Issue Date: February 10, 2017  
Ref. Report No. ISL-16LE167FA-R1

Product Name : Poe Injector  
Model(s) : MIT-69a-bcdefgh  
(more serial models listed on Model Number Definition)  
Applicant : MStronic Co., Ltd.  
Address : 2F, 12, Gongshang Rd., Wugu District, New Taipei City, 248 Taiwan

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

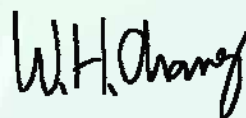
The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance).

## Standards:

FCC CFR Title 47 Part 15 Subpart B: 2015- Section 15.107 and 15.109  
ANSI C63.4-2014  
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 6: 2016  
**Class A**

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



# **FCC TEST REPORT**

of

## **CFR 47 Part 15 Subpart B Class A**

Product : **Poe Injector**

Model(s): **MIT-69a-bcdefgh**

**(more serial models listed on Model Number Definition)**

Applicant: **MSTronic Co., Ltd.**

Address: **2F, 12, Gongshang Rd., Wugu District,**

**New Taipei City, 248 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-16LE167FA-R1**

Issue Date : **February 10, 2017**

This report totally contains 21 pages including this cover page and contents page.

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report must not be used to claim product endorsement by NVLAP, NIST or any other Government agency.

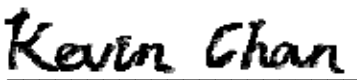
This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.

## Contents of Report

|       |                                                                                 |    |
|-------|---------------------------------------------------------------------------------|----|
| 1.    | General .....                                                                   | 1  |
| 1.1   | Certification of Accuracy of Test Data .....                                    | 1  |
| 1.2   | Description of EUT .....                                                        | 2  |
| 1.3   | Description of Support Equipment .....                                          | 4  |
| 1.4   | Software for Controlling Support Unit .....                                     | 4  |
| 1.5   | I/O Cable Condition of EUT and Support Units .....                              | 4  |
| 2.    | Powerline Conducted Emissions .....                                             | 5  |
| 2.1   | Test Setup and Procedure .....                                                  | 5  |
| 2.1.1 | Test Setup .....                                                                | 5  |
| 2.1.2 | Test Procedure .....                                                            | 5  |
| 2.1.3 | EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested) ..... | 5  |
| 2.2   | Conduction Test Data: Configuration 1 .....                                     | 6  |
| 2.3   | Test Setup Photo .....                                                          | 8  |
| 3.    | Radiated Emissions .....                                                        | 10 |
| 3.1   | Test Setup and Procedure .....                                                  | 10 |
| 3.1.1 | Test Setup .....                                                                | 10 |
| 3.1.2 | Test Procedure .....                                                            | 11 |
| 3.1.3 | Spectrum Analyzer Configuration (for the frequencies tested) .....              | 11 |
| 3.2   | Radiation Test Data: Configuration 1 .....                                      | 12 |
| 3.3   | Test Setup Photo .....                                                          | 14 |
| 4.    | Appendix .....                                                                  | 15 |
| 4.1   | Appendix A: Warning Labels .....                                                | 15 |
| 4.2   | Appendix B: Warning Statement .....                                             | 16 |
| 4.3   | Appendix C: Test Equipment .....                                                | 17 |
| 4.3.1 | Test Equipment List .....                                                       | 17 |
| 4.3.2 | Software for Controlling Spectrum/Receiver and Calculating Test Data .....      | 18 |
| 4.4   | Appendix D: Uncertainty of Measurement .....                                    | 19 |

## 1. General

### 1.1 Certification of Accuracy of Test Data

|                              |                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standards:</b>            | FCC CFR Title 47 Part 15 Subpart B: 2015- Section 15.107 and 15.109<br>ANSI C63.4-2014<br>Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 6: 2016Class A |
| <b>Equipment Tested:</b>     | Poe Injector                                                                                                                                                                    |
| <b>Model:</b>                | MIT-69a-bcdefgh<br>(more serial models listed on Model Number Definition)                                                                                                       |
| <b>Applicant:</b>            | MSTronic Co., Ltd.                                                                                                                                                              |
| <b>Sample received Date:</b> | February 6, 2017                                                                                                                                                                |
| <b>Final test Date:</b>      | refer to the date of test data                                                                                                                                                  |
| <b>Test Site:</b>            | International Standards Laboratory<br>Chamber 12; Conduction 02                                                                                                                 |
| <b>Test Distance:</b>        | 10M; 3M (above1GHz)                                                                                                                                                             |
| <b>Temperature:</b>          | refer to each site test data                                                                                                                                                    |
| <b>Humidity:</b>             | refer to each site test data                                                                                                                                                    |
| <b>Input power:</b>          | Conduction input power: DC 48V<br>Radiation input power: DC 48V                                                                                                                 |
| <b>Test Result:</b>          | PASS                                                                                                                                                                            |
| <b>Report Engineer:</b>      | Jayla Lu                                                                                                                                                                        |
| <b>Test Engineer:</b>        | <br>Kevin Chan                                                                               |
| <b>Approved By:</b>          | <br>W.H. Chang / Director                                                                    |

## 1.2 Description of EUT

This report is to renew model name. It will not inflect the original tests, so it's not necessary to carry out EMC tests again. The test data remains unchanged, as copy from original report: 16LE167FA

### EUT

|                                          |                                                                                            |
|------------------------------------------|--------------------------------------------------------------------------------------------|
| Description                              | Poe Injector                                                                               |
| Condition                                | Pre-Production                                                                             |
| Model                                    | MIT-69a-bcdefgh ( <b>Renew</b> )<br>(more serial models listed on Model Number Definition) |
| Serial Number                            | N/A                                                                                        |
| Highest working frequency                | 66kHz                                                                                      |
| The radiation test should be tested till | 1GHz                                                                                       |

### Model Definition

| Model Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MIT-69a-bcdefgh</b><br>a=Giga board =G(with Giga board),or N(without the board).<br>b=input voltage =48(36-72Vdc) or 12(9-36Vdc),<br>c=output voltage=48(48Vdc) or 24(24Vdc) or 18(18Vdc)<br>d=output pinout =A(on data pairs, PCB#14-05MIT-69G-A) or<br>B(on spare pairs, PCB#14-05MIT-69G-B)<br>e=detection =D(detection) or N(no detection)<br>f=reverse pinout =R(reverse=12+/36- , 45-/78+) or N(12-/36+ , 45+/78-)<br>g=enclosure =M(metal) or N(plastic)<br>h=means operation temperature=H (-40C~+70C) or N(-25C~+50C) |

The I/O ports of EUT are listed below:

| I/O Port Type          | Quantity |
|------------------------|----------|
| DC Jack                | 1        |
| RJ45 Port (POE)        | 1        |
| RJ45 Port (Switch Hub) | 1        |

The EUT listed below is chosen by the applicant to be the representative configuration for testing in this report.

### Test configurations:

| Configuration | Test Model              |
|---------------|-------------------------|
| 1             | EUT (MIT-69G-4824BNNNN) |

**EMI Noise Source:**

| Refer to the photo | Crystal | Point |
|--------------------|---------|-------|
| EUT-5              | 66kHz   | T1    |

**EMI Solution:**

N/A

### 1.3 Description of Support Equipment

| No | Unit              | Model / Serial No.             | Brand     | Power Cord   | FCC ID  |
|----|-------------------|--------------------------------|-----------|--------------|---------|
| 1  | DC Power Supply   | PSW 160-21.6<br>S/N: GEP152286 | GWWINSTEK | Non-shielded | FCC DOC |
| 2  | Personal Computer | RW7<br>S/N: N/A                | Lenovo    | Non-shielded | FCC DOC |
| 3  | Notebook          | TP00026A<br>S/N: N/A           | Lenovo    | Non-shielded | FCC DOC |
| 4  | Support POE       | N/A<br>S/N: N/A                | N/A       | Non-shielded | FCC DOC |
| 5  | LOAD              | N/A<br>S/N: N/A                | N/A       | 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:

1. Receive and transmit package of PC to the EUT through LAN port.
2. Receive and transmit package and dc power of Support POE to the EUT through POE port.
3. Receive and transmit package of NB to the Support POE through LAN port.
4. Support POE with LOAD.
5. Repeat the above steps.

|     | Filename | Issued Date |
|-----|----------|-------------|
| LAN | Ping.exe |             |

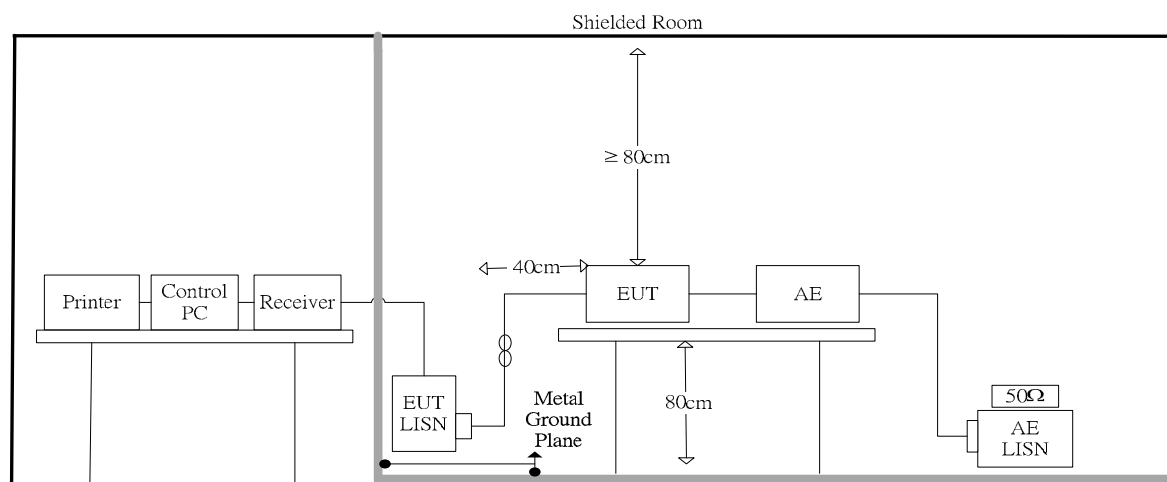
### 1.5 I/O Cable Condition of EUT and Support Units

| Description    | Path                                     | Cable Length | Cable Type   |
|----------------|------------------------------------------|--------------|--------------|
| DC Power cable | 48~72V to EUT SPS                        | 1.8m         | Non-shielded |
| LAN data cable | PC LAN(RJ-45) Port to EUT LAN port       | 10m          | Non-shielded |
| LAN data cable | Support POE (RJ-45) Port to EUT POE port | 10m          | Non-shielded |
| LAN data cable | Support POE (RJ-45) Port to NB LAN port  | 10m          | Non-shielded |

## 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.

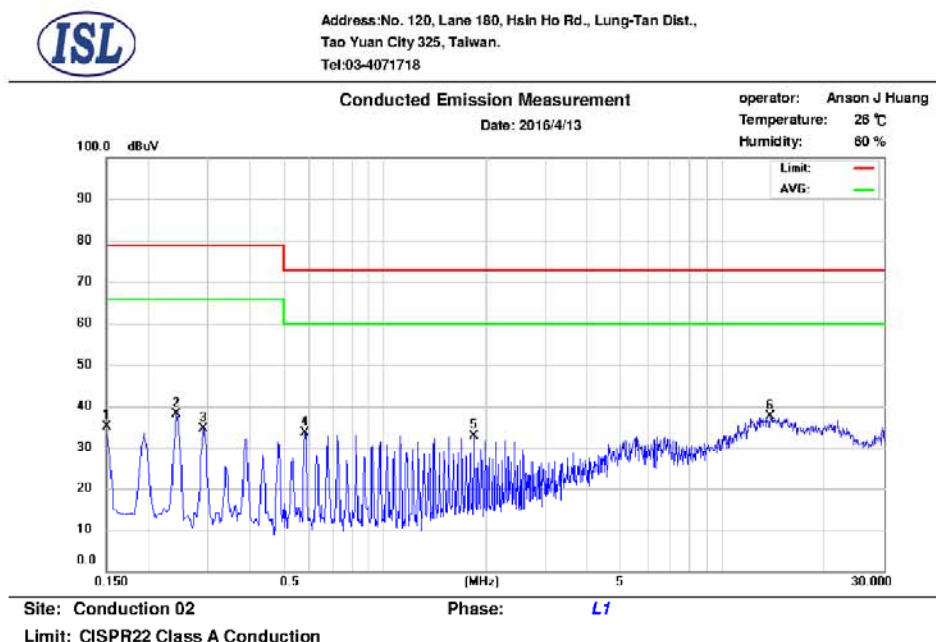
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

#### 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<br>(MHz) | QP_R<br>(dBuV) | AVG_R<br>(dBuV) | Correct<br>Factor<br>(dB) | QP<br>Emission<br>(dBuV) | QP<br>Limit<br>(dBuV) | QP<br>Margin<br>(dB) | AVG<br>Emission<br>(dBuV) | AVG<br>Limit<br>(dBuV) | AVG<br>Margin<br>(dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 1   | 0.150              | 24.70          | 24.99           | 9.64                      | 34.34                    | 79.00                 | -44.66               | 34.63                     | 66.00                  | -31.37                |
| 2   | 0.242              | 27.75          | 28.03           | 9.65                      | 37.40                    | 79.00                 | -41.60               | 37.68                     | 66.00                  | -28.32                |
| 3   | 0.290              | 24.43          | 24.68           | 9.65                      | 34.08                    | 79.00                 | -44.92               | 34.33                     | 66.00                  | -31.67                |
| 4   | 0.582              | 23.18          | 23.42           | 9.67                      | 32.85                    | 73.00                 | -40.15               | 33.09                     | 60.00                  | -26.91                |
| 5   | 1.842              | 22.78          | 22.96           | 9.71                      | 32.49                    | 73.00                 | -40.51               | 32.67                     | 60.00                  | -27.33                |
| 6   | 13.902             | 20.82          | 15.44           | 9.95                      | 30.77                    | 73.00                 | -42.23               | 25.39                     | 60.00                  | -34.61                |

Note:

Margin = QP/AVG Emission - Limit

QP/AVG Emission = QP\_R/AVG\_R + Correct Factor

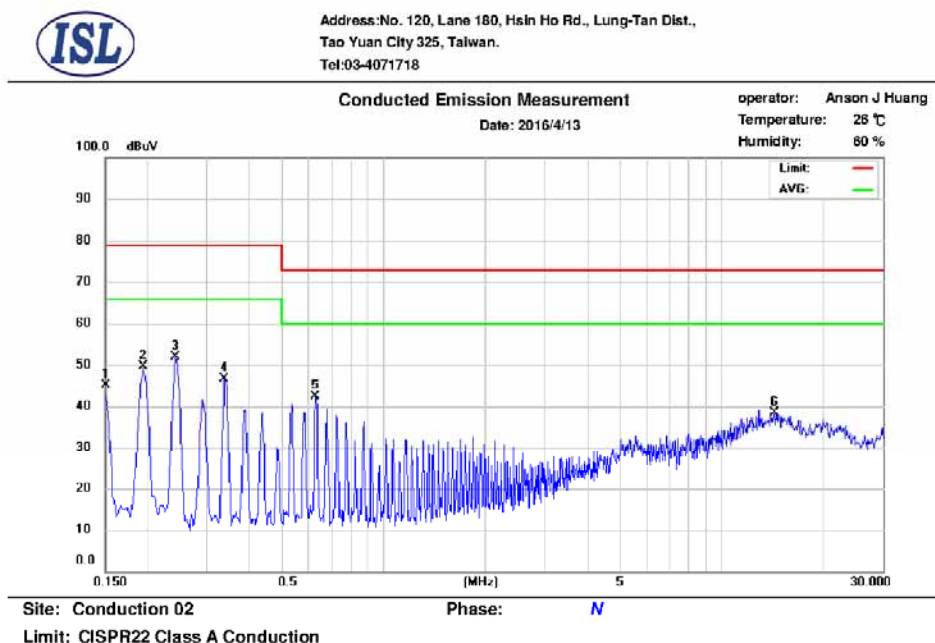
Correct Factor = LISN Loss + Cable Loss

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.

**Table 2.2.2 Power Line Conducted Emissions (Neutral)**



| No. | Frequency<br>(MHz) | QP_R<br>(dBuV) | AVG_R<br>(dBuV) | Correct<br>Factor<br>(dB) | QP<br>Emission<br>(dBuV) | QP<br>Limit<br>(dBuV) | QP<br>Margin<br>(dB) | AVG<br>Emission<br>(dBuV) | AVG<br>Limit<br>(dBuV) | AVG<br>Margin<br>(dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 1   | 0.150              | 35.06          | 35.35           | 9.63                      | 44.69                    | 79.00                 | -34.31               | 44.98                     | 66.00                  | -21.02                |
| 2   | 0.194              | 39.45          | 39.73           | 9.63                      | 49.08                    | 79.00                 | -29.92               | 49.36                     | 66.00                  | -16.64                |
| 3   | 0.242              | 41.85          | 42.13           | 9.63                      | 51.48                    | 79.00                 | -27.52               | 51.76                     | 66.00                  | -14.24                |
| 4   | 0.338              | 36.71          | 37.00           | 9.63                      | 46.34                    | 79.00                 | -32.66               | 46.63                     | 66.00                  | -19.37                |
| 5   | 0.630              | 32.10          | 32.40           | 9.65                      | 41.75                    | 73.00                 | -31.25               | 42.05                     | 60.00                  | -17.95                |
| 6   | 14.398             | 21.05          | 15.56           | 10.00                     | 31.05                    | 73.00                 | -41.95               | 25.56                     | 60.00                  | -34.44                |

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.

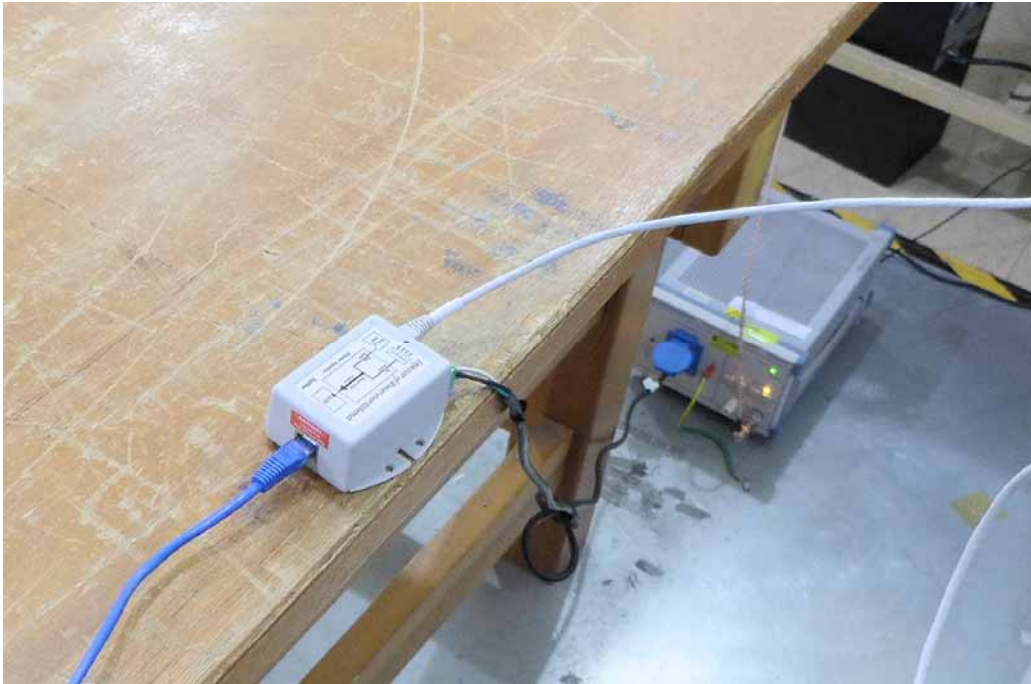
If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

## 2.3 Test Setup Photo

Front View



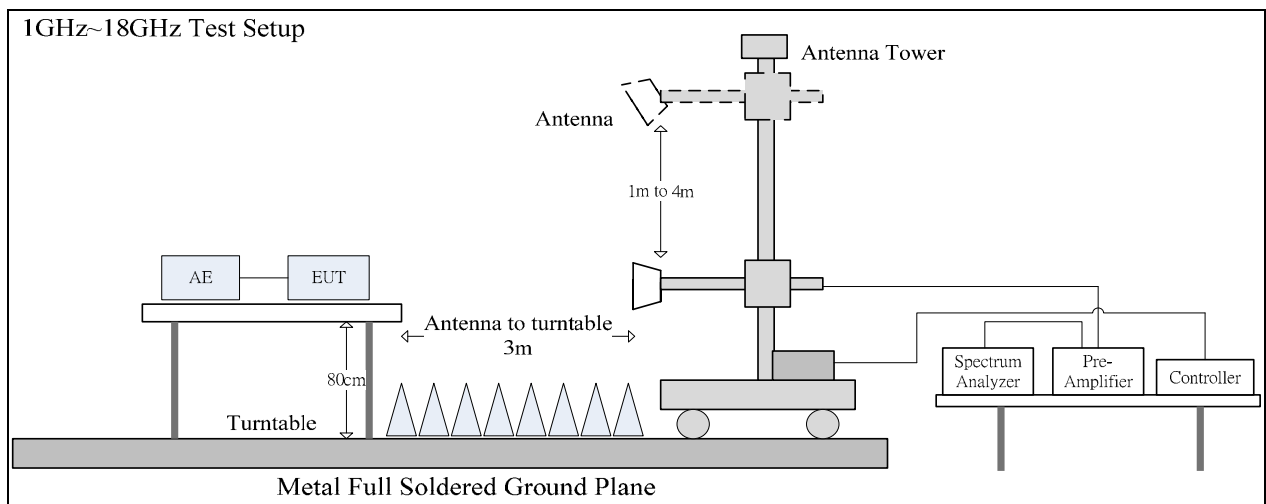
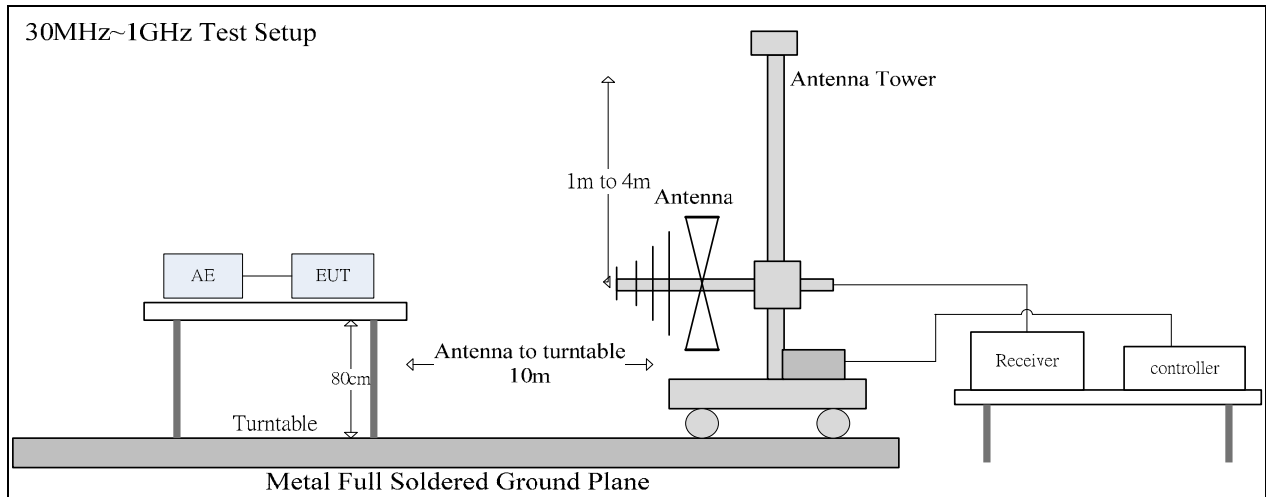
Back View



### 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.

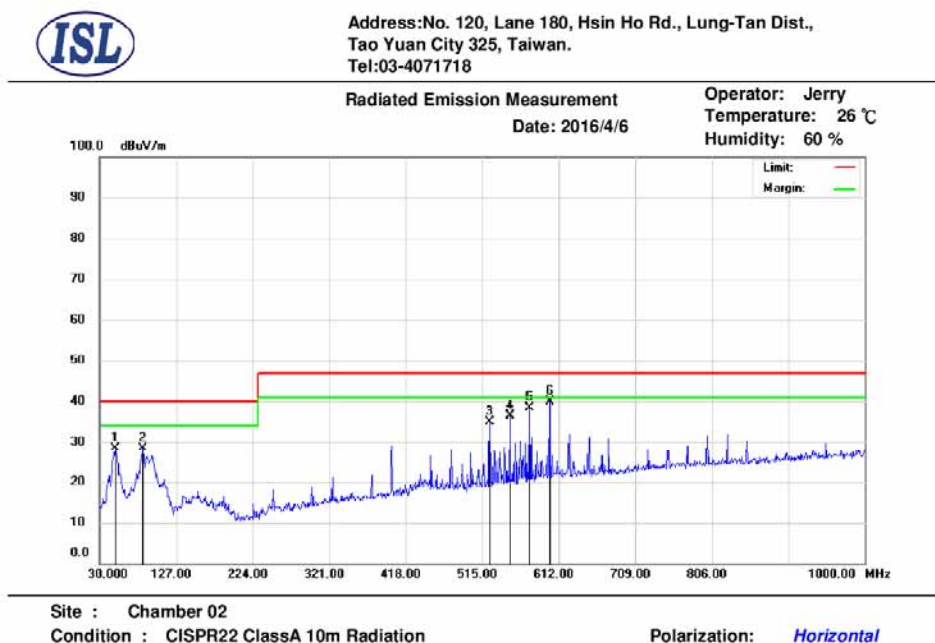
The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency 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. Spectrum Analyzer Configuration (for the frequencies tested).

### 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   | 50.37           | 45.24       | -16.98               | 28.26             | 40.00          | -11.74      | 124          | 20             | peak     |
| 2   | 85.29           | 49.95       | -21.55               | 28.40             | 40.00          | -11.60      | 114          | 309            | peak     |
| 3   | 524.70          | 44.64       | -9.68                | 34.96             | 47.00          | -12.04      | 348          | 19             | peak     |
| 4   | 549.92          | 45.60       | -9.30                | 36.30             | 47.00          | -10.70      | 207          | 14             | peak     |
| 5   | 575.14          | 46.75       | -8.45                | 38.30             | 47.00          | -8.70       | 253          | 186            | peak     |
| 6   | 600.36          | 47.43       | -7.62                | 39.81             | 47.00          | -7.19       | 225          | 297            | peak     |

\* Note:

Margin = Emission – Limit

Emission = Radiated Amplitude + Correct Factor

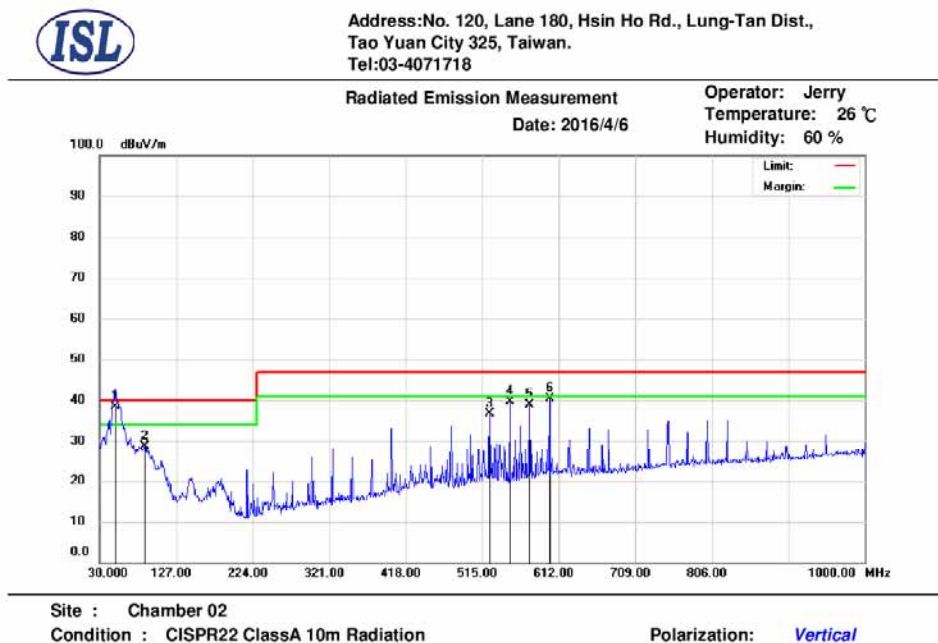
Correct Factor = Antenna Correction Factor + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

BILOG Antenna Distance: 10 meters

Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.

**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   | 50.79           | 55.37       | -16.99               | 38.38             | 40.00          | -1.62       | 100          | 302            | QP       |
| 2   | 87.23           | 50.51       | -21.88               | 28.63             | 40.00          | -11.37      | 399          | 174            | peak     |
| 3   | 524.70          | 46.25       | -9.68                | 36.57             | 47.00          | -10.43      | 128          | 249            | peak     |
| 4   | 549.92          | 48.89       | -9.30                | 39.59             | 47.00          | -7.41       | 100          | 200            | peak     |
| 5   | 575.14          | 47.27       | -8.45                | 38.82             | 47.00          | -8.18       | 100          | 311            | peak     |
| 6   | 600.36          | 47.90       | -7.62                | 40.28             | 47.00          | -6.72       | 269          | 266            | peak     |

\* Note:

Margin = Emission – Limit

Emission = Radiated Amplitude + Correct Factor

Correct Factor = Antenna Correction Factor + Cable Loss

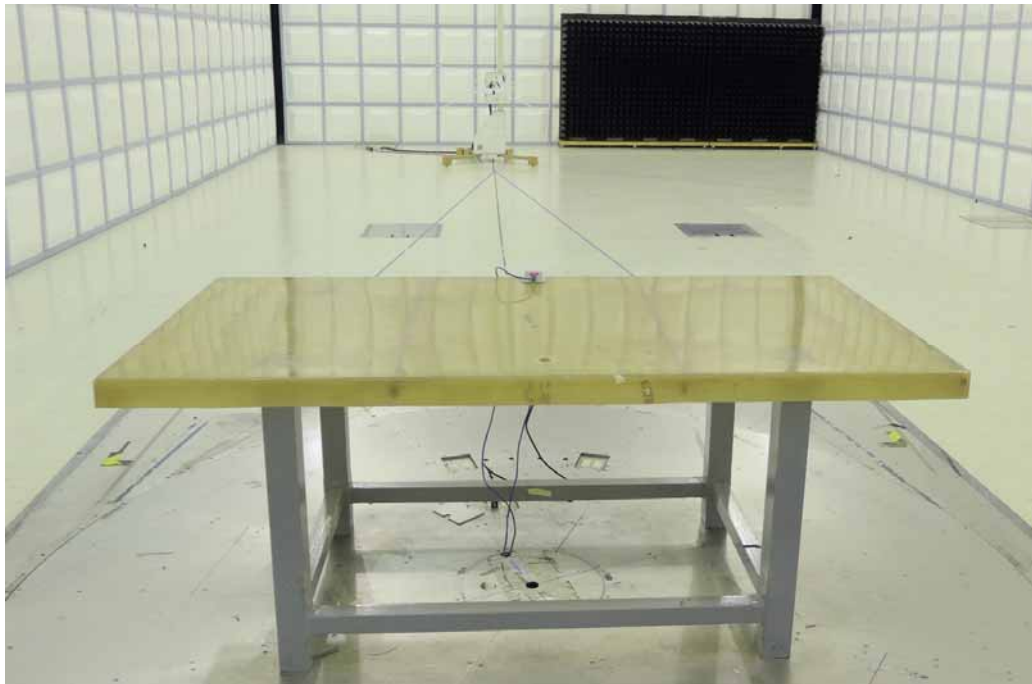
A margin of -8dB means that the emission is 8dB below the limit

BILOG Antenna Distance: 10 meters

**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**

### 3.3 Test Setup Photo

Front View (30MHz~1GHz)



Back View (30MHz~1GHz)



## 4. Appendix

### 4.1 Appendix A: Warning Labels

#### Label Requirements

A Class A digital device subject to Verification of FCC shall carry a warning 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.

## 4.2 Appendix B: Warning Statement

### Statement Requirements

The operators' manual for a Class A 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 A 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 commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

\* \* \* \* \*

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<br>Con02 | Equipment Name           | Brand             | Model      | S/N                 | Last Cal.<br>Date | Next Cal.<br>Date |
|-------------------|--------------------------|-------------------|------------|---------------------|-------------------|-------------------|
| Conduction 02     | LISN 15                  | R&S               | ENV216     | 101335              | 09/18/2015        | 09/18/2016        |
| Conduction 02     | LISN 03                  | ROHDE&SCHWARZ     | ESH3/Z5    | 828874/010          | 02/26/2016        | 02/26/2017        |
| Conduction 02     | Conduction 02-1<br>Cable | WOKEN             | CFD 300-NL | Conduction<br>02 -1 | 07/17/2015        | 07/17/2016        |
| Conduction 02     | EMI Receiver 14          | ROHDE&<br>SCHWARZ | ESCI       | 101034              | 06/04/2015        | 06/04/2016        |

| Location<br>Chmb12       | Equipment Name                  | Brand              | Model                                       | S/N               | Last Cal.<br>Date | Next Cal.<br>Date |
|--------------------------|---------------------------------|--------------------|---------------------------------------------|-------------------|-------------------|-------------------|
| Radiation<br>(Chamber12) | BILOG Antenna 18                | Schwarzbeck        | Schwarzbeck<br>VULB<br>9168+EMCI-N<br>-6-05 | 646               | 01/11/2016        | 01/11/2017        |
| Radiation<br>(Chamber12) | Preamplifier 26                 | EMCI               | EMC9135                                     | 980297            | 01/21/2016        | 01/21/2017        |
| Radiation<br>(Chamber12) | Coaxial Cable Chmb<br>12-10M-01 | PEWC               | CFD400-NL                                   | Chmb<br>12-10M-01 | 07/17/2015        | 07/17/2016        |
| Radiation<br>(Chamber12) | EMI Receiver 10                 | ROHDE &<br>SCHWARZ | ESCI                                        | 100567            | 07/30/2015        | 07/30/2016        |

#### 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:  $\pm 2.88\text{dB}$

<Chamber 12 (10M)>

Horizontal

30MHz~200MHz:  $\pm 3.93\text{dB}$

200MHz~1000MHz:  $\pm 4.09\text{dB}$

Vertical

30MHz~200MHz:  $\pm 4.58\text{dB}$

200MHz~1000MHz:  $\pm 3.99\text{dB}$