# Verification of Conformity

The products

**EUT : PICO-IMX6**
**Trade Name : AAEON**
**Model No. : PICO-IMX6-A10-xxxx**

**( x - Where x may be any combination of alphanumeric characters or "-"or blank for marketing purpose)**

which produced by

**Aaeon Technology Inc.**
**5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C**

Regulation Applied: FCC Rules and Regulations Part 15 Subpart B ; Class A

I HEREBY CERTIFY THAT : The data shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

S. S. Liou

Signature
S. S. Liou
Section Manager of EMC Testing Department II
Electronics Testing Center, Taiwan

Report Number : 15-07-RBF-042-02

Date of Issue: Jul. 28, 2015

**Note：**
1. **The results of the testing report relate only to the items tested.**
2. **The testing report shall not be reproduced except in full, without the written approval of ETC.**

ELECTRONICS TESTING CENTER, TAIWAN
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# FCC CLASS A
# EMI TEST REPORT

# of

E.U.T. : PICO-IMX6

Model No. : PICO-IMX6-A10-xxxx

( x - Where x may be any combination of alphanumeric characters or "-"or blank for marketing purpose)

# for

**APPLICANT :** Aaeon Technology Inc.

**ADDRESS :** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C

Test Performed by

**ELECTRONICS TESTING CENTER, TAIWAN**

NO. 34. LIN 5. DINGFU VIL., LINKOU DIST.,
NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.TEL :
(02)26023052 FAX: (02)26010910

http:// www.etc.org.tw ; e-mail:emc@etc.org.tw

Report Number : 15-07-RBF-042-02

# TEST REPORT VERIFICATION

| | |
|---|---|
| Applicant | : Aaeon Technology Inc.<br>5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C |
| Manufacture | : Aaeon Technology Inc.<br>5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C |
| Description of EUT | : |
| a) Type of EUT | : PICO-IMX6 |
| b) Trade Name | : AAEON |
| c) Model No. | : PICO-IMX6-A10-XXXX |
| d) Power Supply | : 120V60Hz |

Regulation Applied : FCC Rules and Regulations Part 15 Subpart B

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

| | | |
|---|---|---|
| *Date Test Item Received* | : | *Jul. 21, 2015* |
| *Date Test Campaign Completed* | : | *Jul. 23, 2015* |
| *Date of Issue* | : | *Jul. 28, 2015* |

*Test Engineer* : Brian Haung

*(Brian Haung, Engineer )*

*Approve & Authorized* : S. S. Liou

*S. S. Liou, Section Manager*
*EMC Dept. II of ELECTRONICS TESTING CENTER, TAIWAN*

## Table of Contents Page

# 1 GENERAL INFORMATION

## 1.1 Product Description

a) Type of EUT : PICO-IMX6

b) Trade Name : AAEON

c) Model No. : PICO-IMX6-A10-XXXX

d) Power Supply : 120V60Hz

## 1.2 Characteristics of Device

PICO-IMX6

## 1.3 Test Methodology

Both conducted, radiated, conducted RF output signal and spurious level and transfer switch isolation testing were performed according to the procedures in section 12.2 of ANSI C63.4.

## 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at NO. 34. LIN 5. DINGFU VIL., LINKOU DIST., NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.
This site has been fully described in a report submitted to your office, the effective date through Aug. 05, 2008.

# 2 LIMITATIONS AND LABELING REQUIREMENT

## 2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :

A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

## 2.2 Limitation

### (1) Conducted Emission Requirement

For unintentional device, according to FCC§15.107(a) Line Conducted Emission Limits class A is as following:

| Frequency MHz | Quasi Peak dB $\mu$ V | Average dB $\mu$ V |
|---|---|---|
| 0.15 - 0.5 | 79 | 66 |
| 0.5 - 30.0 | 73 | 60 |

For unintentional device, according to FCC§15.107(a) Line Conducted Emission Limits class B is as following:

| Frequency MHz | Quasi Peak dB $\mu$ V | Average dB $\mu$ V |
|---|---|---|
| 0.15 - 0.5 | 66-56 | 56-46 |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

**(2) Radiated Emission Requirement**

For unintentional device, according to FCC §15.109(a), the field strength of radiated emissions from unintentional radiators at a distance of 10 meters shall not exceed the following values:

| Frequency MHZ | Distance Meters | Radiated dBuV/m | Radiated uV/m |
|---|---|---|---|
| 30 - 88 | 10 | 39.0 | 90 |
| 88 - 216 | 10 | 43.5 | 150 |
| 216 - 960 | 10 | 46.4 | 210 |
| Above 960 | 10 | 49.5 | 300 |

For unintentional device, according to FCC §15.109(a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency MHZ | Distance Meters | Radiated dBuV/m | Radiated uV/m |
|---|---|---|---|
| 30 - 88 | 3 | 40.0 | 100 |
| 88 - 216 | 3 | 43.5 | 150 |
| 216 - 960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |

For unintentional device, according to CISPR Line Radiated Emission Limits class A is as following:

| Frequency Range | Distance Meters | Emissions dBuV/m |
|---|---|---|
| 30 - 230 | 10 | 40 |
| 230 - 1000 | 10 | 47 |

For unintentional device, according to CISPR Line Radiated Emission Limits class B is as following:

| Frequency MHz | Distance Meters | Radiated dB $\mu$ V/m |
|---|---|---|
| 30 to 230 | 10 | 30 |
| 230 to 1000 | 10 | 37 |

## 2.3 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

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.

## 2.4 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

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 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 may cause harmful interference to radio communication. 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.

# 3 SYSTEM TEST CONFIGURATION

## 3.1 Justification

The system was configured for testing in EUT is normally working.

The EUT was rotated to obtain the maximum level of radiated emissions .The antenna was varied in height above ground to obtain the maximum signal strength. The antenna height was varied from 1 to 4 meters.

## 3.2 Device for Tested System

| Device | Manufacturer | Model | Description |
|---|---|---|---|
| PICO-IMX6 * | Aaeon Technology Inc. | PICOIMX6-A10-0001; PICOIMX6-A10-0002 | 1.8m Unshielded AC Adapter Power Cord |
| NB | Lenovo | 7298 RN1 | 1.8mUnshielded AC Power Cord |
| Mouse | DELL | SK-8115 | 1.5m Shielded Cable |
| KeyBoard | DELL | M056UC | 1.5m Shielded Cable |
| Monitor | SNOY | KDL-20S4000 | 1.8m Unshielded AC Power Cord |

Remark "*" means equipment under test.

# 4 RADIATED EMISSION MEASUREMENT

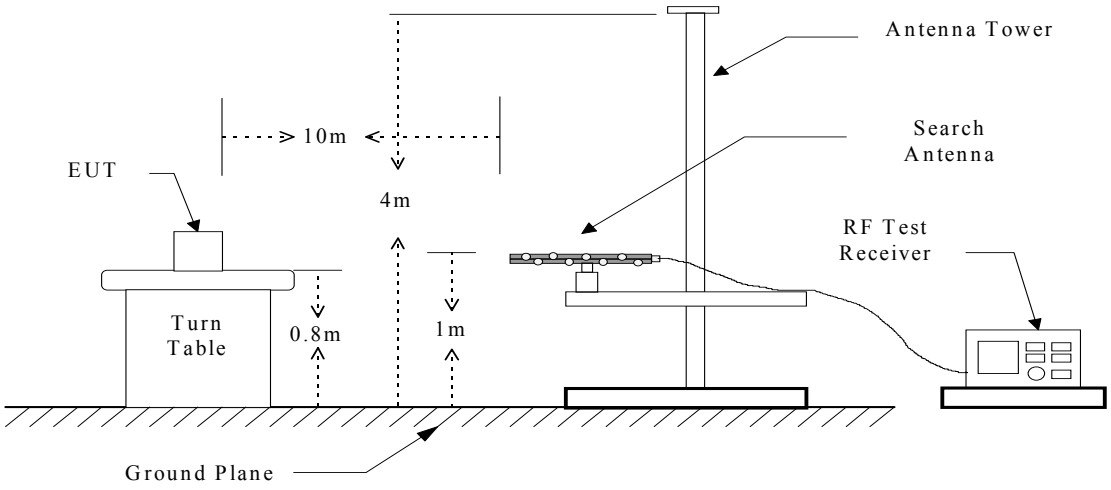
## 4.1 Applicable Standard

For unintentional radiator digital devices, the radiated emission shall comply with § 15.109(a). And according to §15.109 (g), as an alternative to the radiated emission limits is CISPR 22.

## 4.2 Measurement Procedure

1. Setup the configuration per figure 1 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the placement of cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration




## 4.3 Measuring Instrument

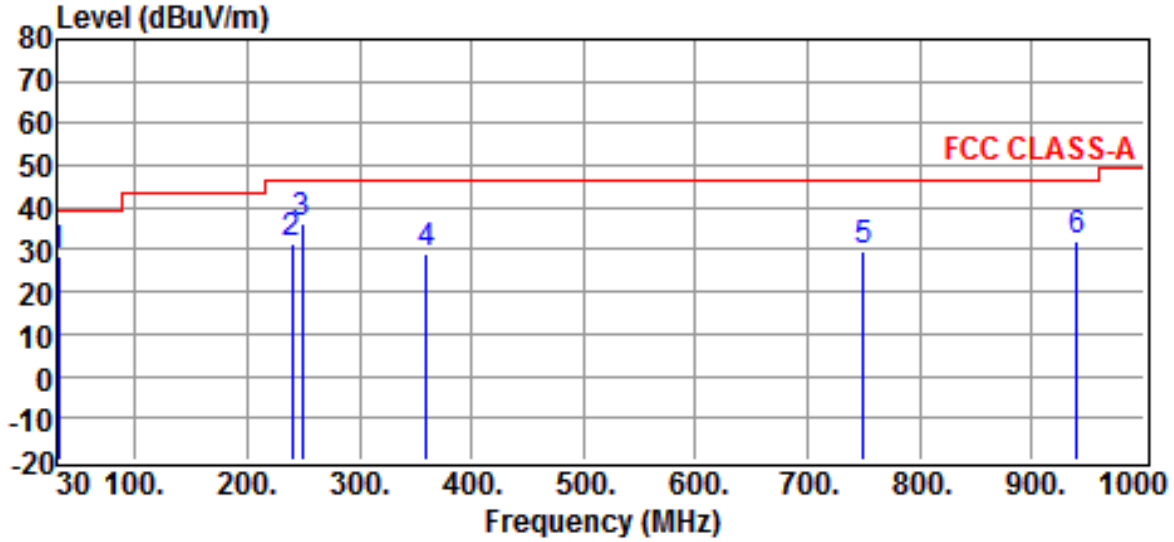
The following test equipment are used during the radiated test .

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 2014/09/09 | 2015/09/08 |
| EMI Test Receiver | Rohde & Schwarz | ESL | 2015/03/26 | 2016/03/25 |
| Bi-Log Antenna | ETC | MCTD 2786 | 2015/06/18 | 2016/06/16 |
| Double Ridged Antenna | EMCO | 3115 | 2014/08/18 | 2015/08/17 |
| Amplifier | HP | 83051A | 2014/10/22 | 2015/10/21 |
| Amplifier | HP | 8447D | 2014/11/10 | 2015/11/09 |

Measuring instrument setup in measured frequency band when specified detector function is used :

| Frequency Band (MHz) | Instrument | Function | Resolution bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 30 to 1000 | RF Test Receiver | Quasi-Peak | 120 kHz | N/A |
| | Spectrum Analyzer | Peak | 100 kHz | 100 kHz |
| Above 1000 | Spectrum Analyzer | Peak | 1 MHz | 1 MHz |
| | Spectrum Analyzer | Average | 1 MHz | 10Hz |

## 4.4 Radiated Emission Data

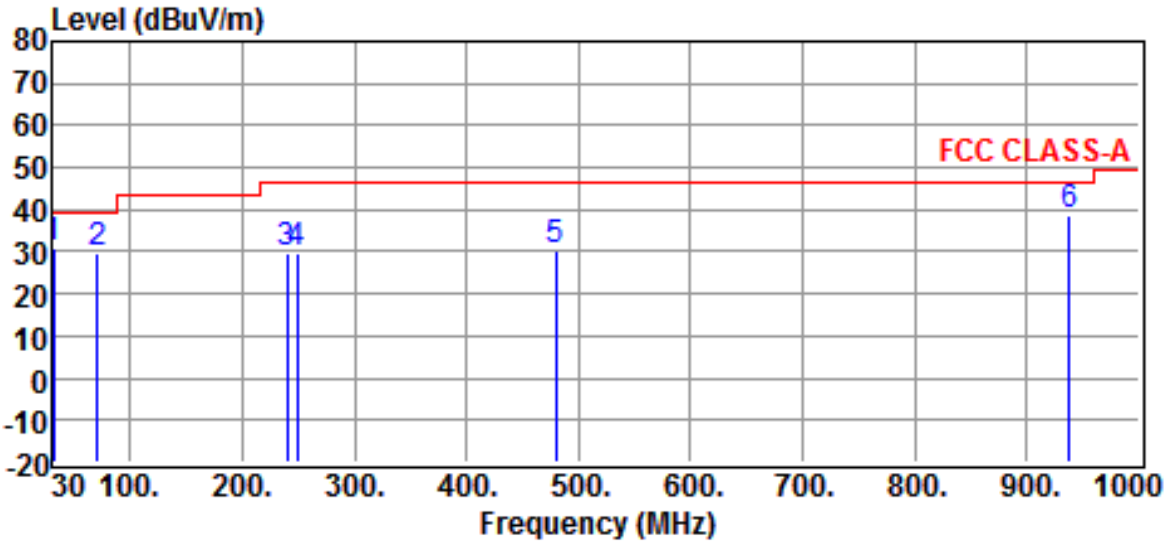



| | | | |
|---|---|---|---|
| Site | :OPEN SITE | Date | :2015-07-21 |
| Limit | :FCC CLASS-A | Ant. Pol. | :HORIZONTAL |
| EUT | :PICO-IMX6 | Model | :PICO-IMX6 |
| Power Rating | :AC 120V60Hz | Temp. | :28˚C |
| Engineer | :Brian Haung | Humi. | :53 % |
| Test Mode | :Operation Mode | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBuV/m | Limits<br>dBuV/m | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 31.9400 | 10.0 | 18.6 | 28.6 | 39.0 | -10.4 | QP |
| 239.5200 | 17.0 | 14.2 | 31.2 | 46.4 | -15.2 | QP |
| 249.2200 | 19.9 | 16.1 | 36.0 | 46.4 | -10.4 | QP |
| 359.8000 | 9.6 | 19.8 | 29.4 | 46.4 | -17.0 | QP |
| 749.7400 | 2.1 | 27.4 | 29.5 | 46.4 | -16.9 | QP |
| 939.8600 | 0.6 | 31.4 | 32.0 | 46.4 | -14.4 | QP |

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit – Result




| | | | |
|---|---|---|---|
| Site | :OPEN SITE | Date | :2015-07-21 |
| Limit | :FCC CLASS-A | Ant. Pol. | :VERTICAL |
| EUT | :PICO-IMX6 | Model | :PICO-IMX6 |
| Power Rating | :AC 120V60Hz | Temp. | :28˚C |
| Engineer | :Brian Haung | Humi. | :53 % |
| Test Mode | :Operation Mode | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBuV/m | Limits<br>dBuV/m | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 31.9400 | 12.4 | 18.6 | 31.0 | 39.0 | -8.0 | QP |
| 70.7400 | 21.7 | 7.7 | 29.4 | 39.0 | -9.6 | QP |
| 239.5200 | 15.8 | 14.2 | 30.0 | 46.4 | -16.4 | QP |
| 249.2200 | 13.3 | 16.1 | 29.4 | 46.4 | -17.0 | QP |
| 480.0800 | 7.1 | 23.0 | 30.1 | 46.4 | -16.3 | QP |
| 937.9200 | 7.2 | 31.3 | 38.5 | 46.4 | -7.9 | QP |

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit – Result

## 4.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

***Result = Reading + Corrected Factor***

where

Corrected Factor = Antenna FACTOR + Cable Loss + High Pass Filter Loss - Amplifier Gain

## 4.6 Photos of Radiation Measuring Setup

# 5. CONDUCTED EMISSION MEASUREMENT

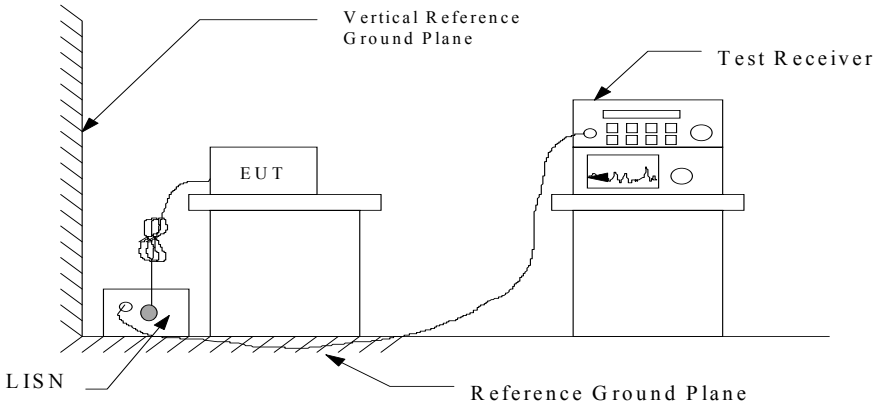
## 5.1 Description

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and § 15.207(a) respectively. Both Limits are identical specification.

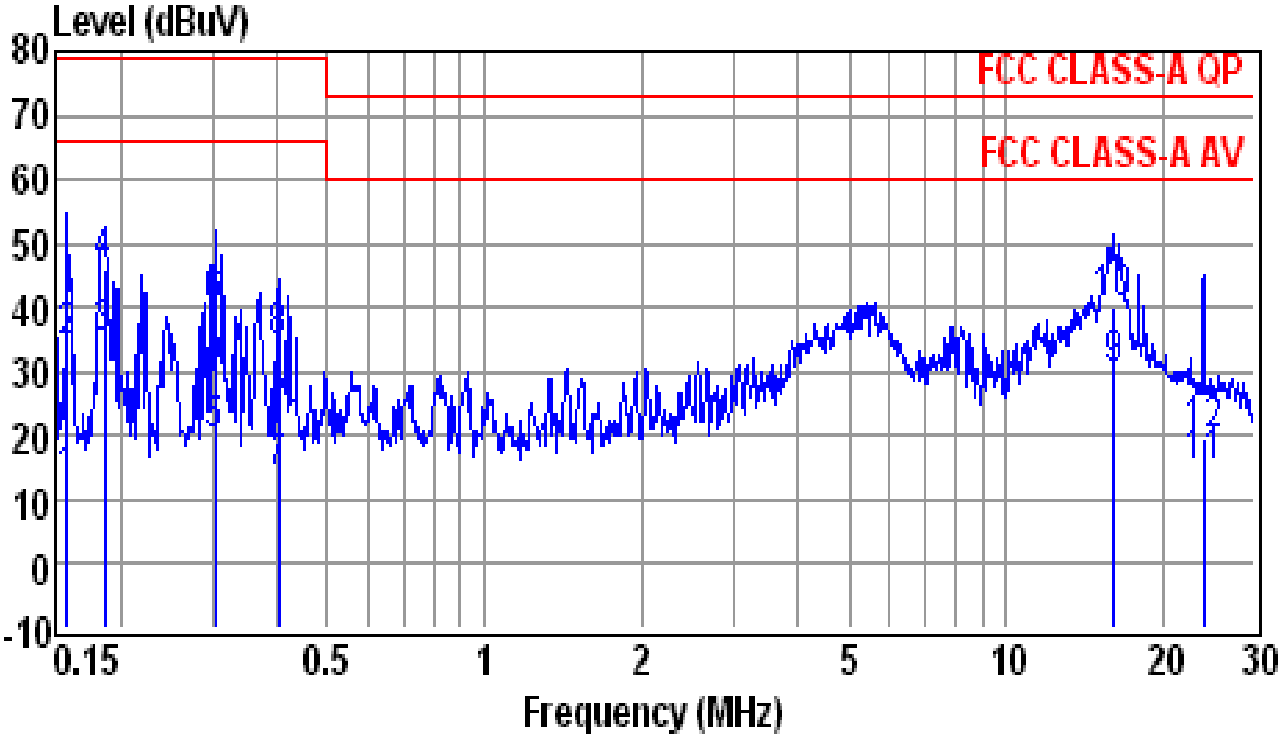
## 5.2 Measurement Procedure

1. Setup the configuration per figure 2.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 2 : Conducted emissions measurement configuration



## 5.3 Conducted Emission Data



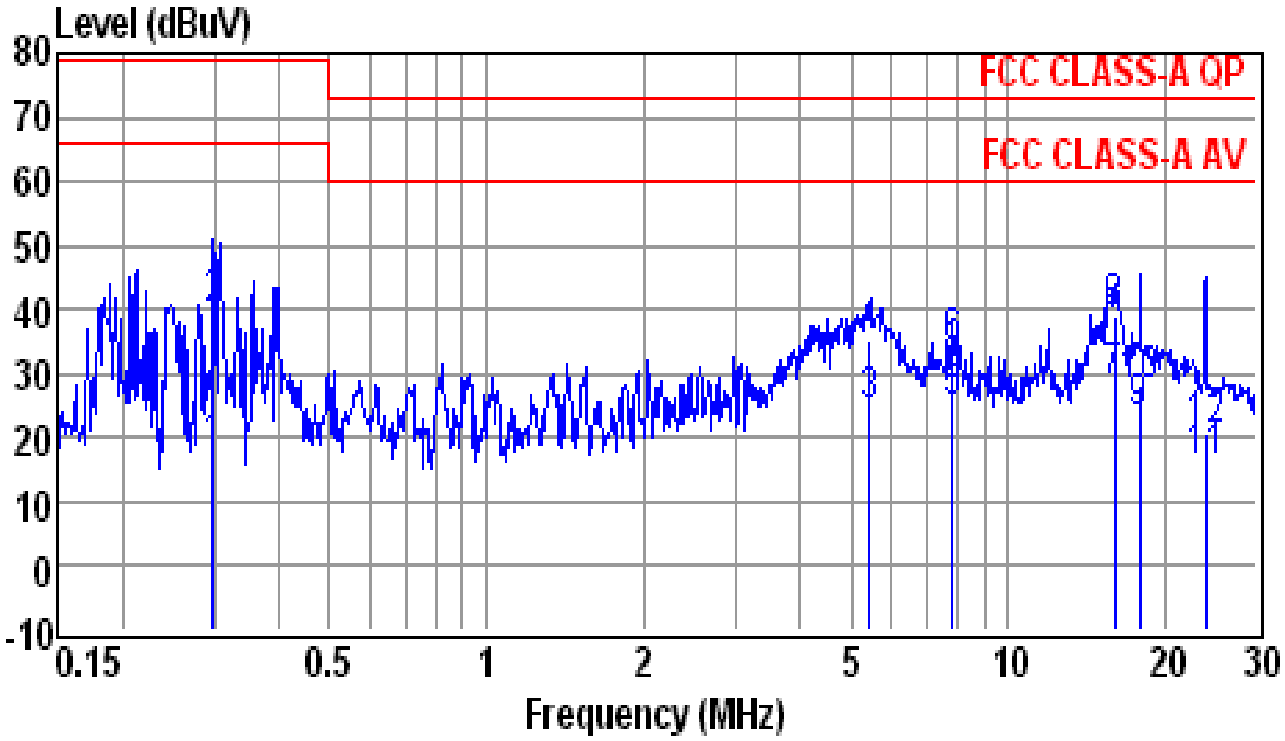

| | | | |
|---|---|---|---|
| Site | : conducted #1 | Date | : 07-23-2015 |
| Condition | : FCC CLASS-A QP | LISN | : NEUTRAL |
| Tem / Hum | : 28 ℃ / 53% | Test Mode | : Operation Mode |
| EUT | : PICO-IMX6 | | |
| Power Rating | : AC 120V60Hz | | |
| Memo | : | Memo | : |

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 0.1582 | -7.97 | 20.18 | 12.21 | 66.00 | -53.79 | Average |
| 0.1582 | 13.88 | 20.18 | 34.06 | 79.00 | -44.94 | QP |
| 0.1864 | 14.78 | 20.18 | 34.96 | 66.00 | -31.04 | Average |
| 0.1864 | 26.03 | 20.18 | 46.21 | 79.00 | -32.79 | QP |
| 0.3035 | -0.72 | 20.19 | 19.47 | 66.00 | -46.53 | Average |
| 0.3035 | 19.42 | 20.19 | 39.61 | 79.00 | -39.39 | QP |
| 0.4040 | -6.51 | 20.21 | 13.70 | 66.00 | -52.30 | Average |
| 0.4040 | 14.21 | 20.21 | 34.42 | 79.00 | -44.58 | QP |
| 16.1400 | 8.77 | 20.86 | 29.63 | 60.00 | -30.37 | Average |
| 16.1400 | 19.17 | 20.86 | 40.03 | 73.00 | -32.97 | QP |

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 24.0150 | -5.76 | 20.82 | 15.06 | 60.00 | -44.94 | Average |
| 24.0150 | -0.98 | 20.82 | 19.84 | 73.00 | -53.16 | QP |

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss




Site : conducted #1
Condition : FCC CLASS-A QP
Tem / Hum : 28 ℃ / 53%
EUT : PICO-IMX6
Power Rating : AC 120V60Hz

Date : 07-23-2015
LISN : LINE
Test Mode : Operation Mode

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 0.2987 | -2.79 | 20.18 | 17.39 | 66.00 | -48.61 | Average |
| 0.2987 | 19.40 | 20.18 | 39.58 | 79.00 | -39.42 | QP |
| 5.4190 | 3.84 | 20.47 | 24.31 | 60.00 | -35.69 | Average |
| 5.4190 | 14.98 | 20.47 | 35.45 | 73.00 | -37.55 | QP |
| 7.8100 | 4.52 | 20.58 | 25.10 | 60.00 | -34.90 | Average |
| 7.8100 | 13.23 | 20.58 | 33.81 | 73.00 | -39.19 | QP |
| 16.0550 | 7.31 | 21.02 | 28.33 | 60.00 | -31.67 | Average |
| 16.0550 | 17.96 | 21.02 | 38.98 | 73.00 | -34.02 | QP |
| 17.9440 | 2.28 | 21.11 | 23.39 | 60.00 | -36.61 | Average |
| 17.9440 | 6.78 | 21.11 | 27.89 | 73.00 | -45.11 | QP |

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 24.0150 | -5.48 | 21.27 | 15.79 | 60.00 | -44.21 | Average |
| 24.0150 | -0.42 | 21.27 | 20.85 | 73.00 | -52.15 | QP |

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

## 5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

***RESULT = READING + LISN FACTOR***

Assume a receiver reading of 22.5 dB $\mu$ V is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dB $\mu$ V.

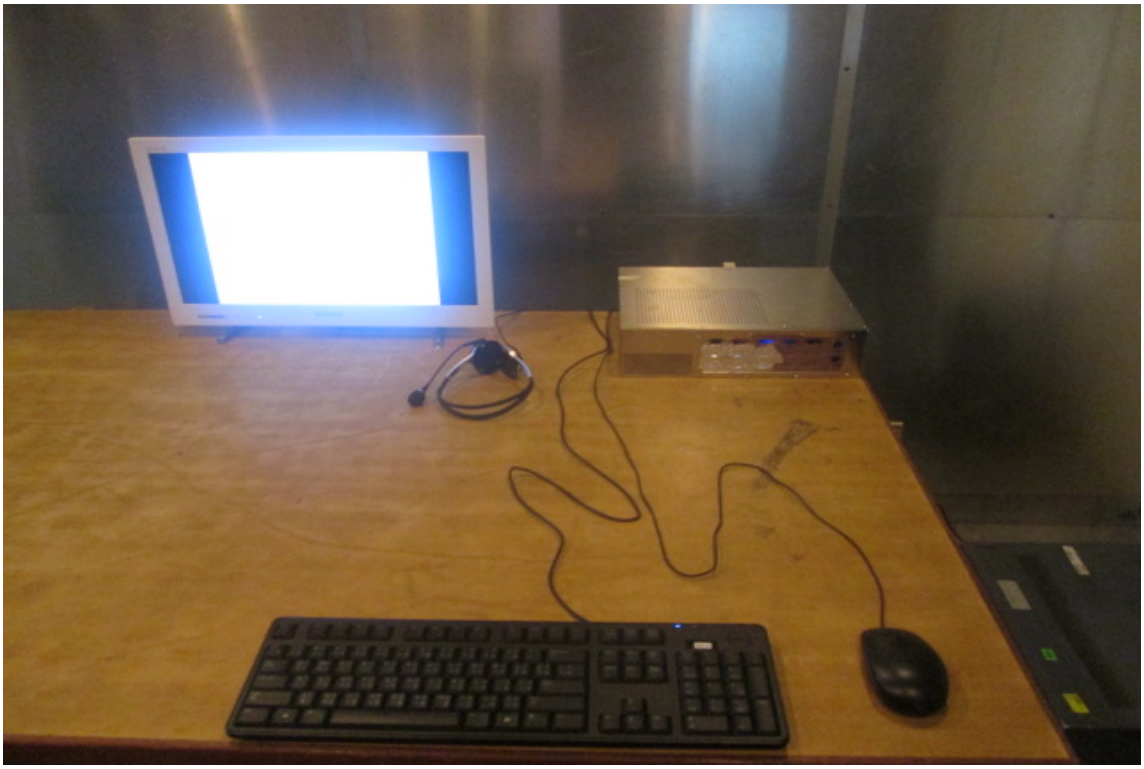
RESULT = 22.5 + 0.1 = 22.6 dB $\mu$ V
Level in $\mu$ V = Common Antilogarithm[(22.6 dB $\mu$ V)/20]
= 13.48 $\mu$ V

## 5.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 2014/09/09 | 2015/09/08 |
| LISN | EMCO | 3625/2 | 2014/10/29 | 2015/10/28 |
| LISN | Rohde & Schwarz | ESH2-Z5 | 2015/04/09 | 2016/04/08 |

## 5.6 Photos of Conduction Measuring Setup



# CONSTRUCTION PHOTOS OF EUT

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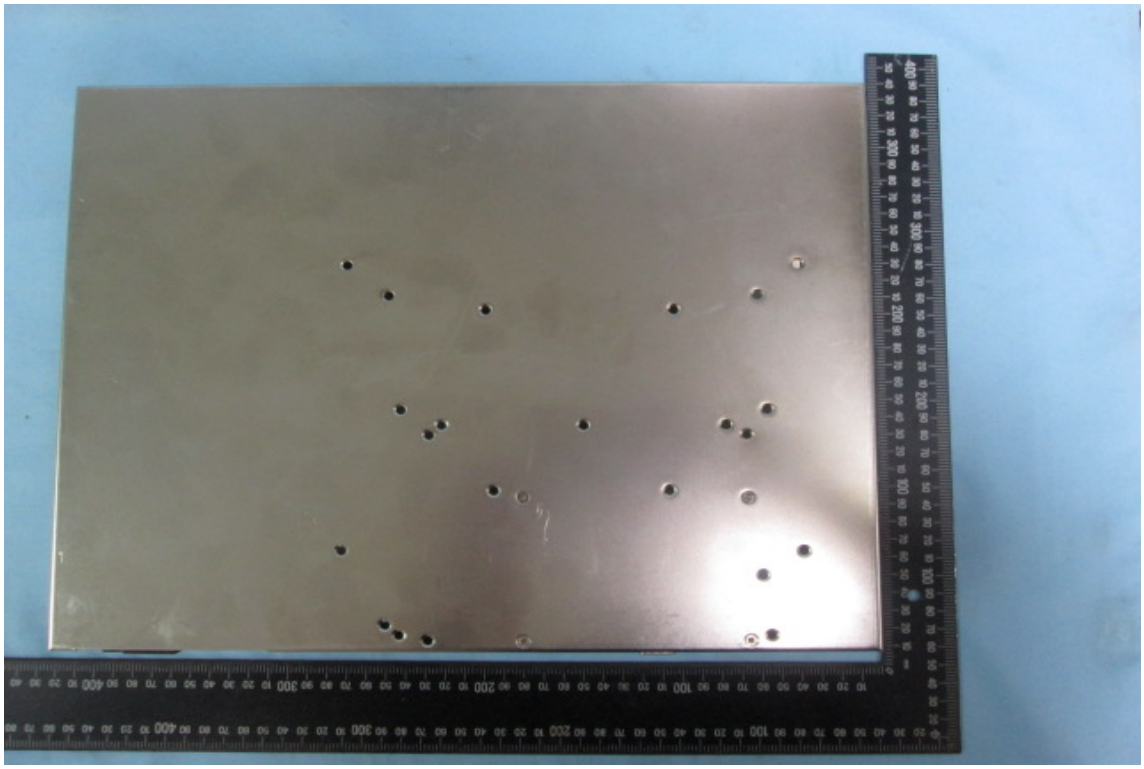

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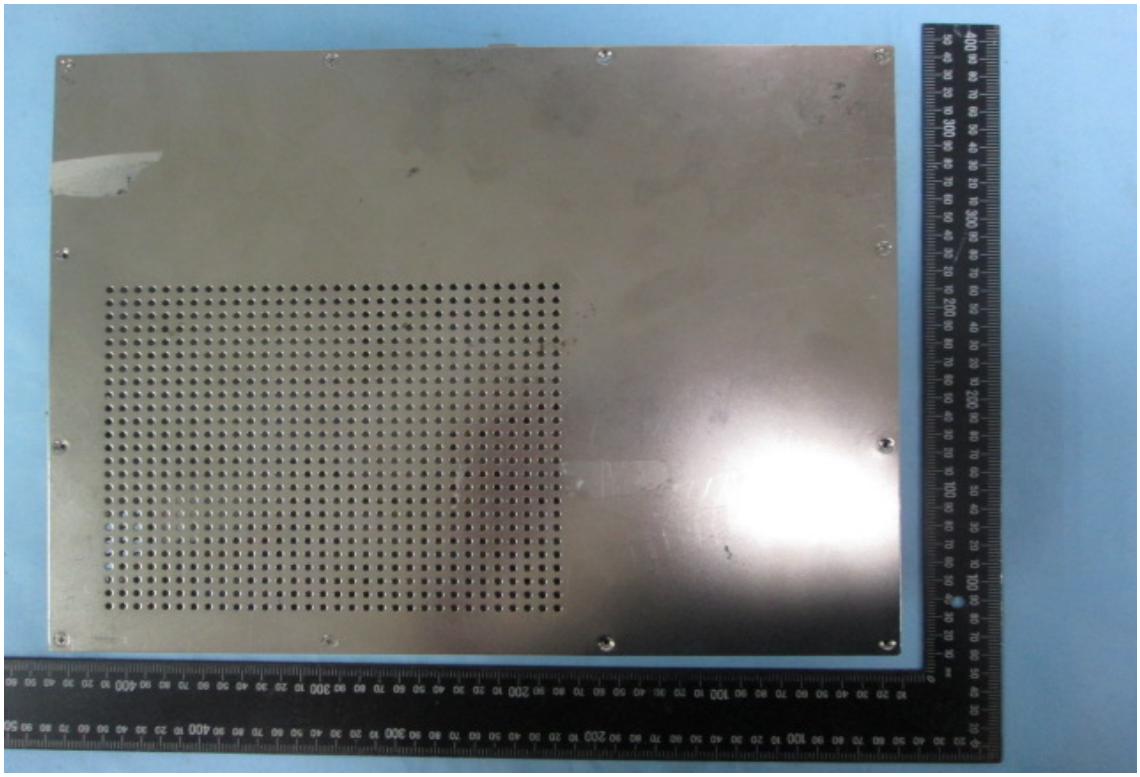
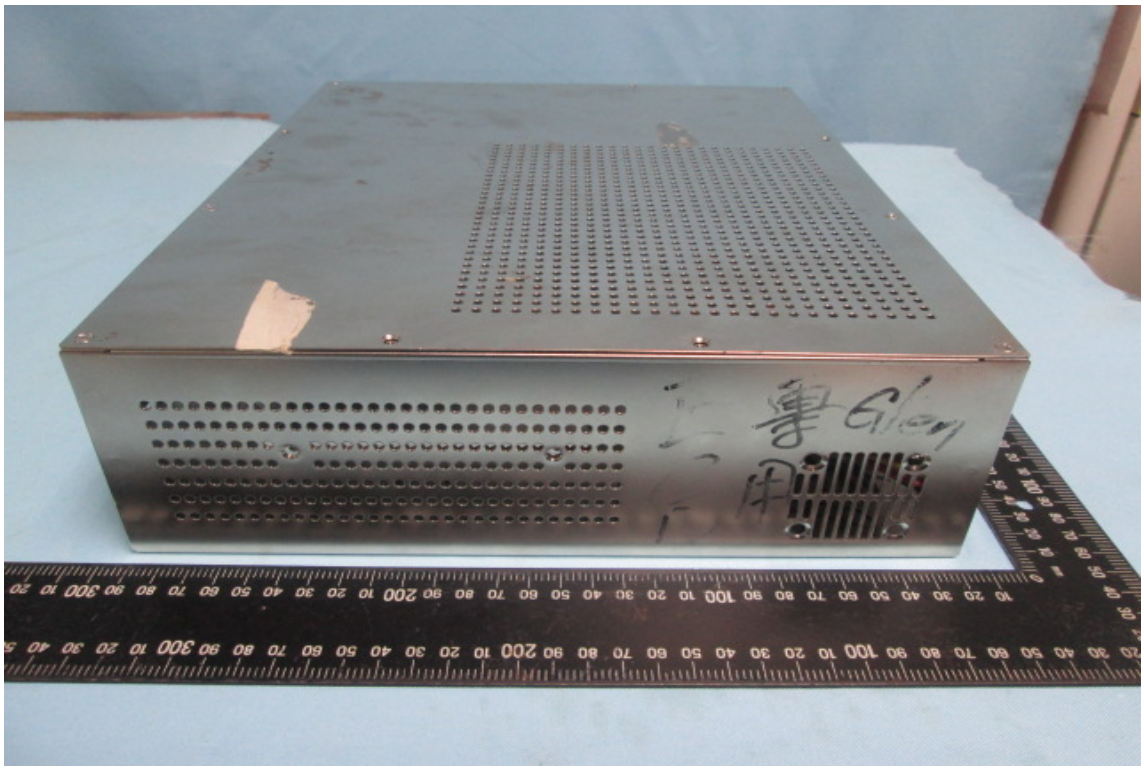


# CONSTRUCTION PHOTOS OF EUT

3.

4.



# CONSTRUCTION PHOTOS OF EUT

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# CONSTRUCTION PHOTOS OF EUT

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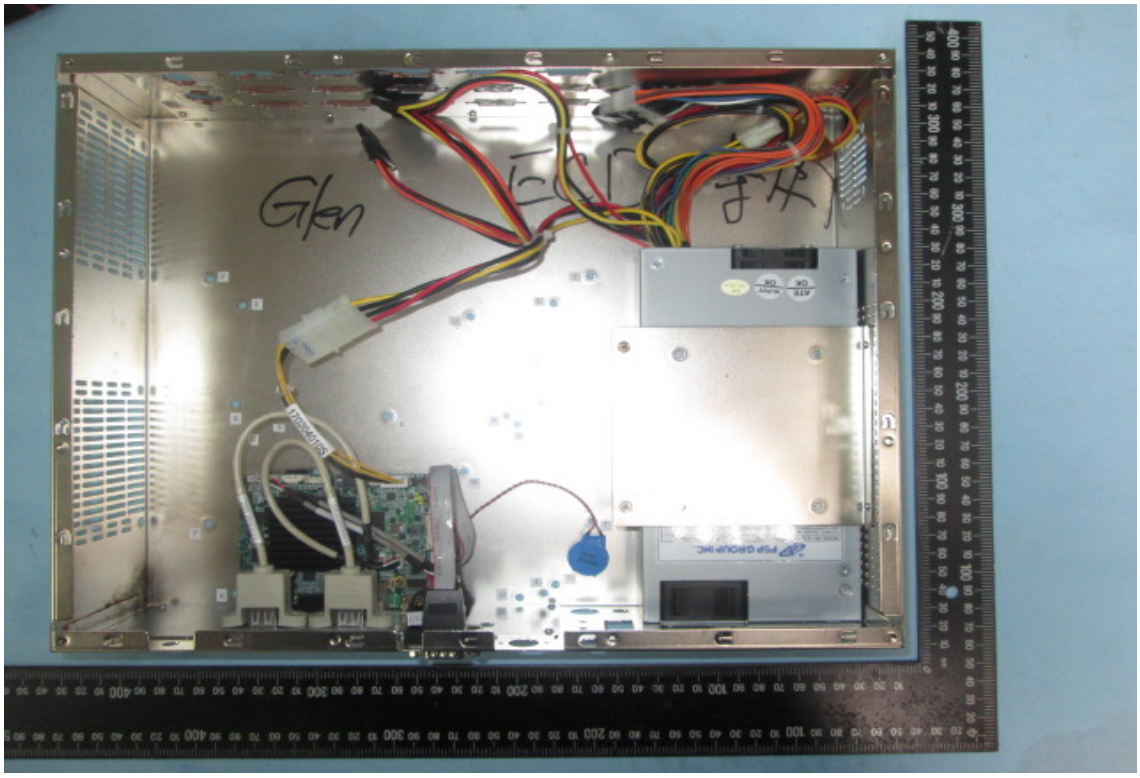

# CONSTRUCTION PHOTOS OF EUT

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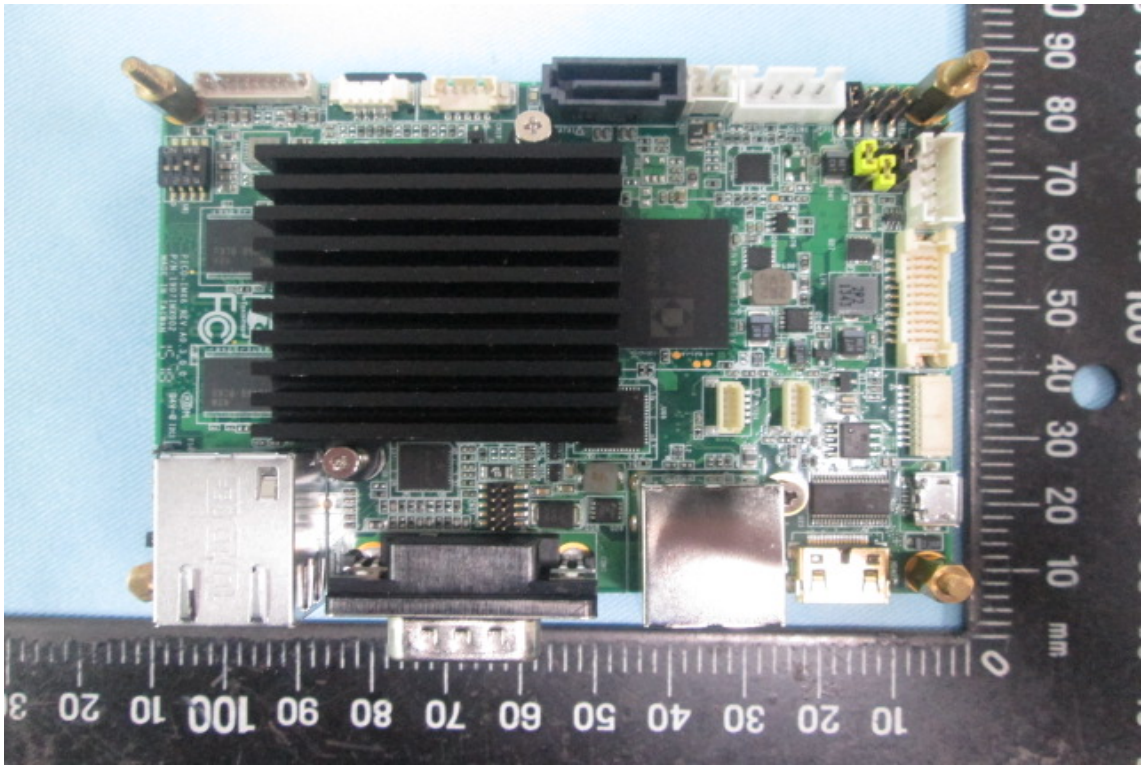

9.