# FCC PART 15 B

# TEST REPORT

For

# HONG KONG IPRO TECHNOLOGY CO.,LIMITED

FLAT/RM A3, 9/F SILVERCORP INT TOWER 707-713 NATHAN RD MONGKOK, HONGKONG

## FCC ID: PQ4IPROFLIP24

| **Report Type:** | **Product Type:** |
|---|---|
| Original Report | Mobile Phone |

**Test Engineer:** Rocky Xiao

**Report Number:** RDG160603004-00B

**Report Date:** 2016-06-15

**Reviewed By:** Dean Liu, RF Engineer

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# GENERAL INFORMATION

## Product Description for Equipment Under Test (EUT)

The *HONG KONG IPRO TECHNOLOGY CO.,LIMITED*'s product, model number: *FLIP 2.4(FCC ID: PQ4IPROFLIP24 )* (the "EUT") in this report was a *Mobile Phone*, which was measured approximately: 98mm (L) x 53mm (W) x13.5 mm (H), rated input voltage: DC 3.7V rechargeable Li-ion battery or DC5.0V charging from adapter.The highest operating frequency is 2480 MHz.

Adapter information:
Model: NTR-05
Input: AC100-240V-50/60 Hz,150mA
Output: DC5.0V, 500mA

*All measurement and test data in this report was gathered from production sample serial number: 160603004 (Assigned by BACL, Dongguan). The EUT was received on 2016-06-03.*

## Objective

This test report is prepared on behalf of *HONG KONG IPRO TECHNOLOGY CO.,LIMITED* in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 B Class B.

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

FCC Part 15C DSS submissions with FCC ID: PQ4IPROFLIP24.
FCC Part 22H & 24E PCE submissions with FCC ID: PQ4IPROFLIP24.

## Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

# SYSTEM TEST CONFIGURATION

## Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

## EUT Exercise Software

N/A

## Equipment Modifications

No modification was made to the EUT tested.

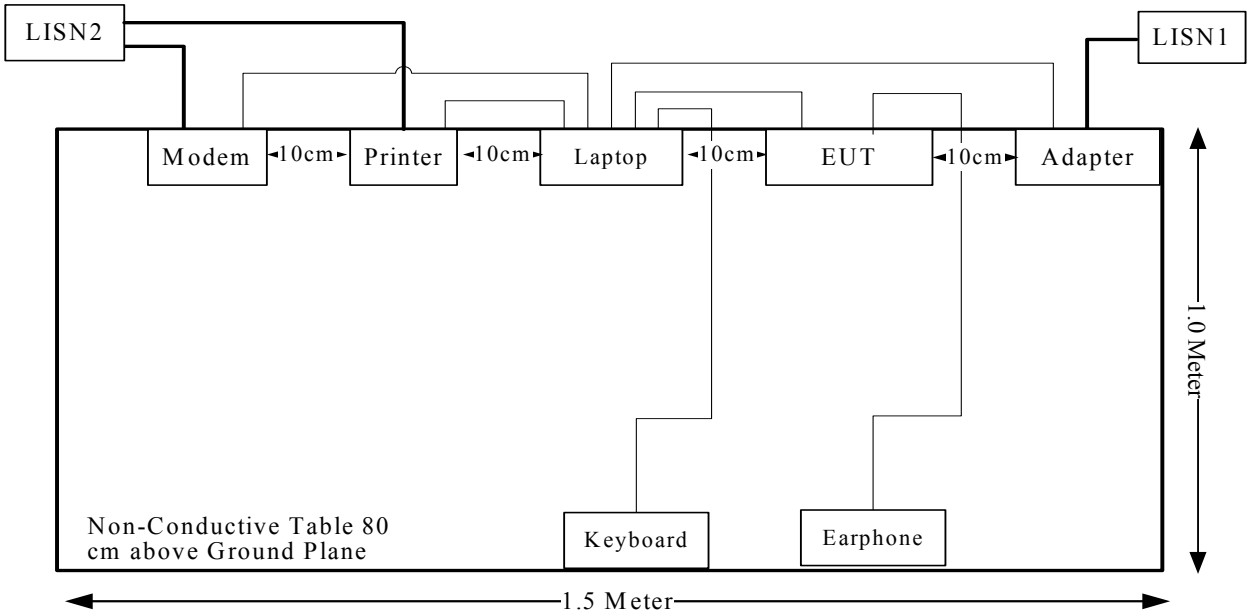
## Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| DELL | Laptop | PP11L | QDS-BRCM1017 |
| HP | Printer | C3941A | JPTVOB2337 |
| DELL | Keyboard | L100 | CNORH656658907BL05DC |
| SAST | Modem | AEM-2100 | 0293 |

## Support Cable List and Details

| Cable Description | Shielding Type | Ferrite Core | Length (m) | From | To |
|---|---|---|---|---|---|
| Serial Cable | Yes | No | 1.2 | Serial Port of Laptop | Modem |
| Parallel Cable | Yes | No | 1.2 | Parallel Port of Laptop | Printer |
| Keyboard Cable | Yes | No | 1.8 | USB Port of Laptop | Keyboard |
| USB Cable | Yes | No | 0.97 | USB Port of Laptop | EUT |
| Earphone Cable | No | No | 1.07 | EUT | Earphone |

## Configuration of Test Setup



# SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Results |
|---|---|---|
| §15.107 | Conducted Emissions | Compliance |
| §15.109 | Radiated Emissions | Compliance |

# FCC§15.107 - CONDUCTED EMISSIONS

## Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are Receiver, cable loss, and LISN.

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If $U_{lab}$ is less than or equal to $U_{cispr}$ of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If $U_{lab}$ is greater than $U_{cispr}$ of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

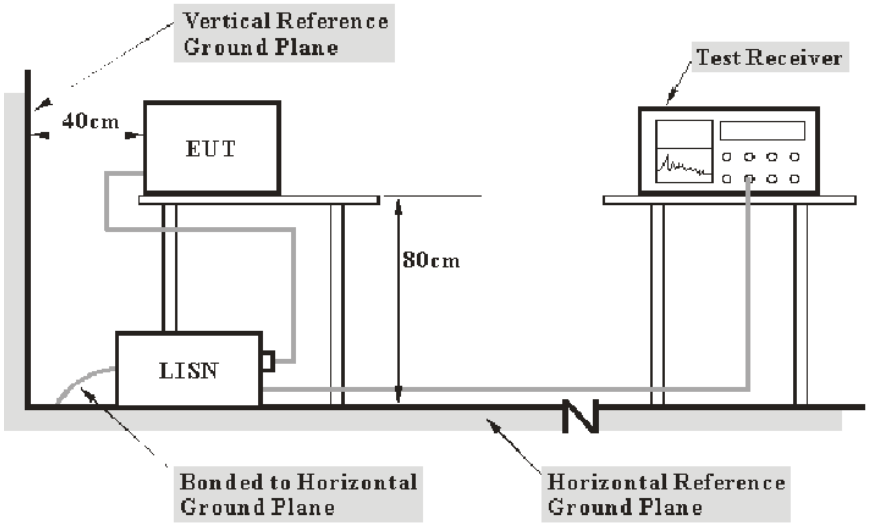
Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz).

Table 1 – Values of $U_{cispr}$

| Measurement | $U_{cispr}$ |
|---|---|
| Conducted disturbance at mains port using AMN (150 kHz to 30 MHz) | 3.4 dB |

Note: The $U_{lab} > U_{cispr}$, so the $U_{lab}$ is add in the calculation.

## EUT Setup




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

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

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

The adapter was connected to a 120V/60Hz AC power source.

## EMI Test Receiver Setup

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

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

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

## Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| R&S | EMI Test Receiver | ESCS 30 | 830245/006 | 2015-12-10 | 2016-12-09 |
| R&S | L.I.S.N | ESH2-Z5 | 892107/021 | 2015-07-16 | 2016-07-15 |
| R&S | Two-line V-network | ENV 216 | 3560.6550.12 | 2015-11-26 | 2016-11-25 |
| N/A | Coaxial Cable | 1.8m | N/A | 2016-05-06 | 2017-05-06 |
| R&S | Test Software | EMC32 | Version8.53.0 | N/A | N/A |

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

## Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

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

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
$V_C$: corrected voltage amplitude

$V_R$: reading voltage amplitude

$A_c$: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

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

Margin = Limit – Corrected Amplitude

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15 B Class B, with the worst margin reading of:

**9.2 dB** at **0.307284 MHz** in the **Line** conducted mode

## Test Data

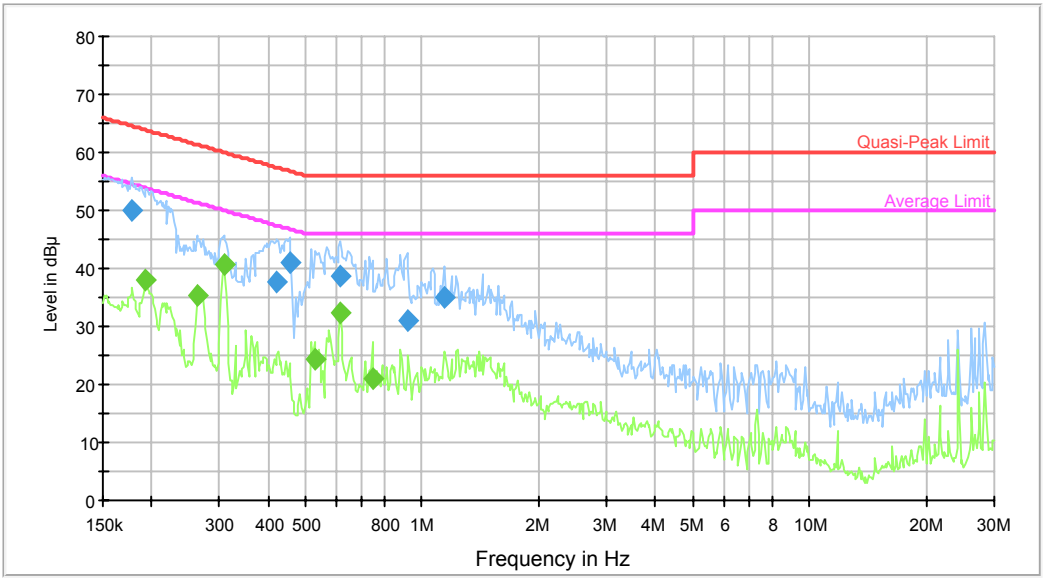
### Environmental Conditions

| | |
|---|---|
| **Temperature:** | 29.2°C |
| **Relative Humidity:** | 58 % |
| **ATM Pressure:** | 100.3 kPa |

*The testing was performed by Rocky Xiao on 2016-06-06.*

*Test Mode: Downloading*

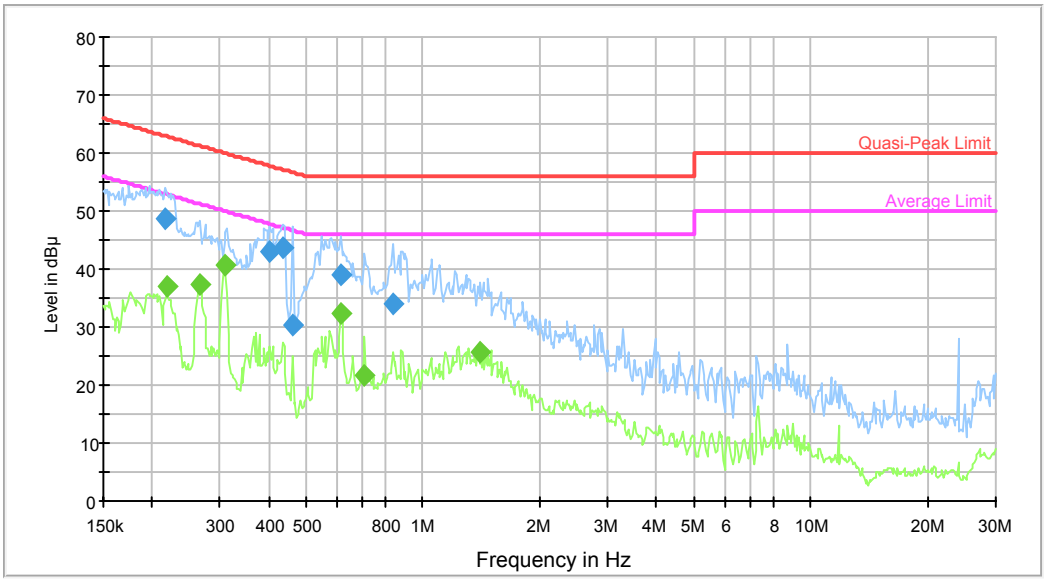
**AC120V, 60Hz, Line:**




| Frequency (MHz) | Quasi Peak (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|
| 0.177322 | 50.1 | 9.000 | L1 | 10.1 | 14.5 | 64.6 | Compliance |
| 0.422630 | 37.8 | 9.000 | L1 | 10.2 | 19.6 | 57.4 | Compliance |
| 0.454052 | 40.9 | 9.000 | L1 | 10.1 | 15.9 | 56.8 | Compliance |
| 0.614619 | 38.8 | 9.000 | L1 | 10.3 | 17.2 | 56.0 | Compliance |
| 0.915445 | 31.1 | 9.000 | L1 | 10.4 | 24.9 | 56.0 | Compliance |
| 1.144267 | 35.0 | 9.000 | L1 | 10.4 | 21.0 | 56.0 | Compliance |

| Frequency (MHz) | Average (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|
| 0.193566 | 37.8 | 9.000 | L1 | 10.2 | 16.1 | 53.9 | Compliance |
| 0.264113 | 35.2 | 9.000 | L1 | 10.2 | 16.1 | 51.3 | Compliance |
| 0.307284 | 40.8 | 9.000 | L1 | 10.3 | 9.2 | 50.0 | Compliance |
| 0.528270 | 24.4 | 9.000 | L1 | 10.1 | 21.6 | 46.0 | Compliance |
| 0.614619 | 32.4 | 9.000 | L1 | 10.3 | 13.6 | 46.0 | Compliance |
| 0.744147 | 21.1 | 9.000 | L1 | 10.4 | 24.9 | 46.0 | Compliance |

**AC120V, 60Hz, Neutral:**




| Frequency (MHz) | Quasi Peak (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|
| 0.216409 | 48.8 | 9.000 | N | 10.2 | 14.2 | 63.0 | Compliance |
| 0.402900 | 43.0 | 9.000 | N | 10.2 | 14.8 | 57.8 | Compliance |
| 0.436318 | 43.5 | 9.000 | N | 10.1 | 13.6 | 57.1 | Compliance |
| 0.461346 | 30.2 | 9.000 | N | 10.1 | 26.5 | 56.7 | Compliance |
| 0.614619 | 39.1 | 9.000 | N | 10.3 | 16.9 | 56.0 | Compliance |
| 0.838622 | 34.1 | 9.000 | N | 10.3 | 21.9 | 56.0 | Compliance |

| Frequency (MHz) | Average (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|
| 0.218141 | 37.1 | 9.000 | N | 10.2 | 15.8 | 52.9 | Compliance |
| 0.266226 | 37.5 | 9.000 | N | 10.2 | 13.7 | 51.2 | Compliance |
| 0.307284 | 40.6 | 9.000 | N | 10.3 | 9.4 | 50.0 | Compliance |
| 0.614619 | 32.3 | 9.000 | N | 10.3 | 13.7 | 46.0 | Compliance |
| 0.709407 | 21.8 | 9.000 | N | 10.4 | 24.2 | 46.0 | Compliance |
| 1.407671 | 25.7 | 9.000 | N | 10.4 | 20.3 | 46.0 | Compliance |

# FCC §15.109 - RADIATED SPURIOUS EMISSIONS

## Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If $U_{lab}$ is less than or equal to $U_{cispr}$ of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If $U_{lab}$ is greater than $U_{cispr}$ of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

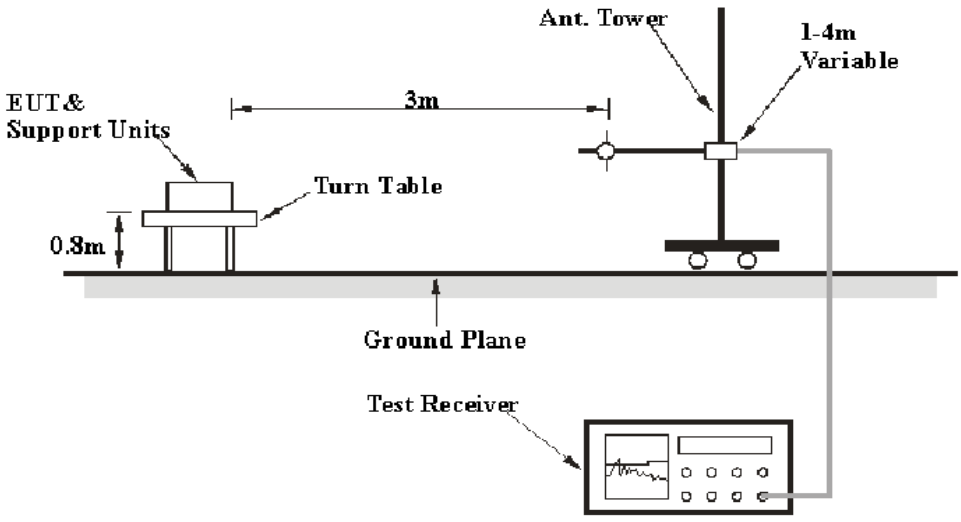
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of $U_{cispr}$

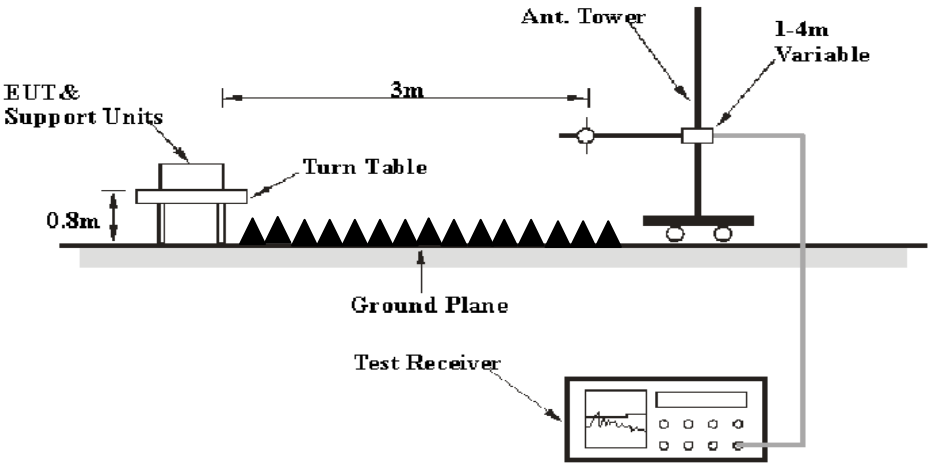
| Measurement | | $U_{cispr}$ |
|---|---|---|
| Radiated disturbance (electric field strength at an OATS or in a SAC) | (30 MHz to 1000 MHz) | 6.3 dB |
| Radiated disturbance (electric field strength in a FAR) | (1 GHz to 6 GHz) | 5.2 dB |
| Radiated disturbance (electric field strength in a FAR) | (6 GHz to 18 GHz) | 5.5 dB |

## EUT Setup

Below 1GHz:



Above 1GHz:




The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 13 GHz.

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

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

## Test Procedure

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

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

## Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| R&S | EMI Test Receiver | ESCI | 100224 | 2015-08-03 | 2016-08-02 |
| Sunol Sciences | Antenna | JB3 | A060611-3 | 2014-11-06 | 2017-11-05 |
| HP | Amplifier | 8447E | 2434A02181 | 2015-09-01 | 2016-09-01 |
| Agilent | Spectrum Analyzer | E4440A | SG43360054 | 2015-11-23 | 2016-11-22 |
| ETS-Lindgren | Horn Antenna | 3115 | 9808-5557 | 2015-09-06 | 2018-09-06 |
| Mini-Circuit | Amplifier | ZVA-213-S+ | 054201245 | 2016-02-19 | 2017-02-19 |
| N/A | Coaxial Cable | 14m | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Coaxial Cable | 8m | N/A | 2016-05-06 | 2017-05-06 |
| Farad | Test Software | EZ-EMC | V1.1.4.2 | N/A | N/A |

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

## Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15 B Class B, with the worst margin reading of:

**3.10dB** at **252.1300MHz** in the **Horizontal** polarization

## Test Data

### Environmental Conditions

| | |
|---|---|
| **Temperature:** | 25.4 °C |
| **Relative Humidity:** | 61 % |
| **ATM Pressure:** | 100.2kPa |

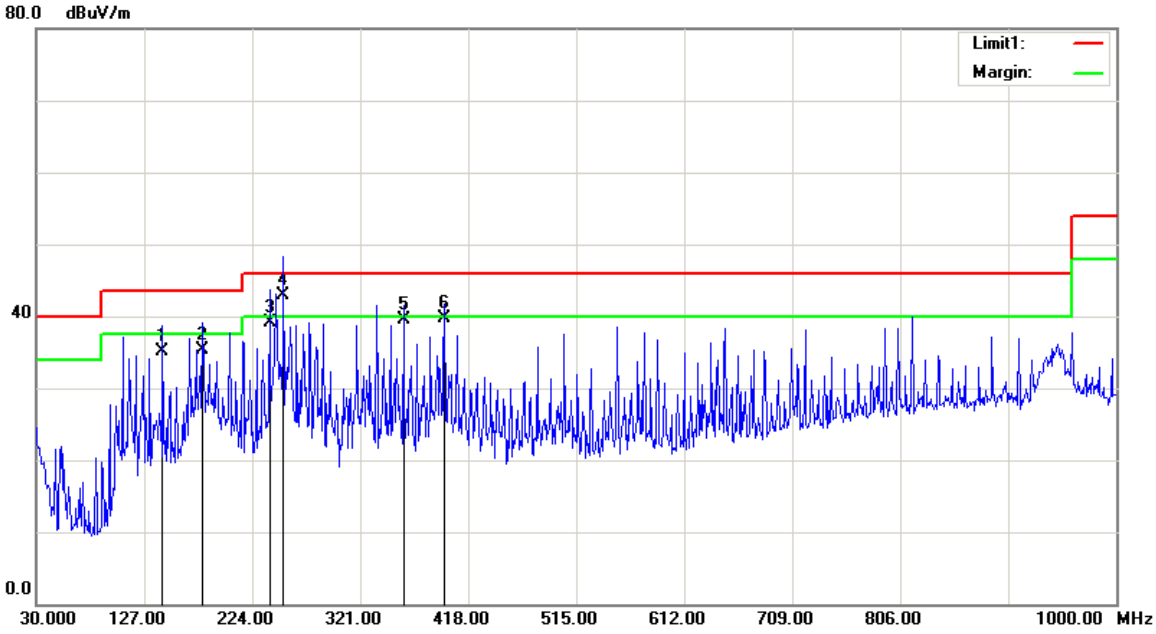
*The testing was performed by Rocky Xiao on 2016-06-03.*

*Test Result: Compliance*

**1) Below 1GHz:**

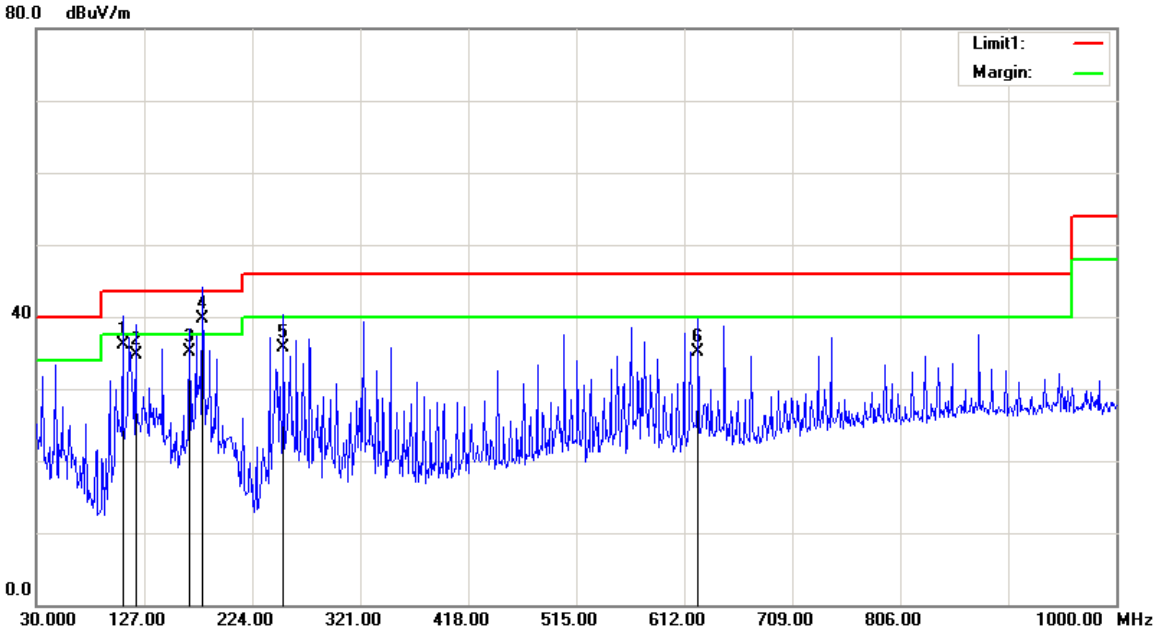
*Test Mode: Downloading*

**Horizontal**




| Frequency (MHz) | Receiver Reading (dBµV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 143.4900 | 42.02 | QP | -6.92 | 35.10 | 43.50 | 8.40 |
| 179.3800 | 43.60 | QP | -8.30 | 35.30 | 43.50 | 8.20 |
| 239.5200 | 46.70 | QP | -7.60 | 39.10 | 46.00 | 6.90 |
| 252.1300 | 50.63 | QP | -7.73 | 42.90 | 46.00 | 3.10 |
| 359.8000 | 44.15 | QP | -4.55 | 39.60 | 46.00 | 6.40 |
| 396.6600 | 43.38 | QP | -3.68 | 39.70 | 46.00 | 6.30 |

**Vertical**

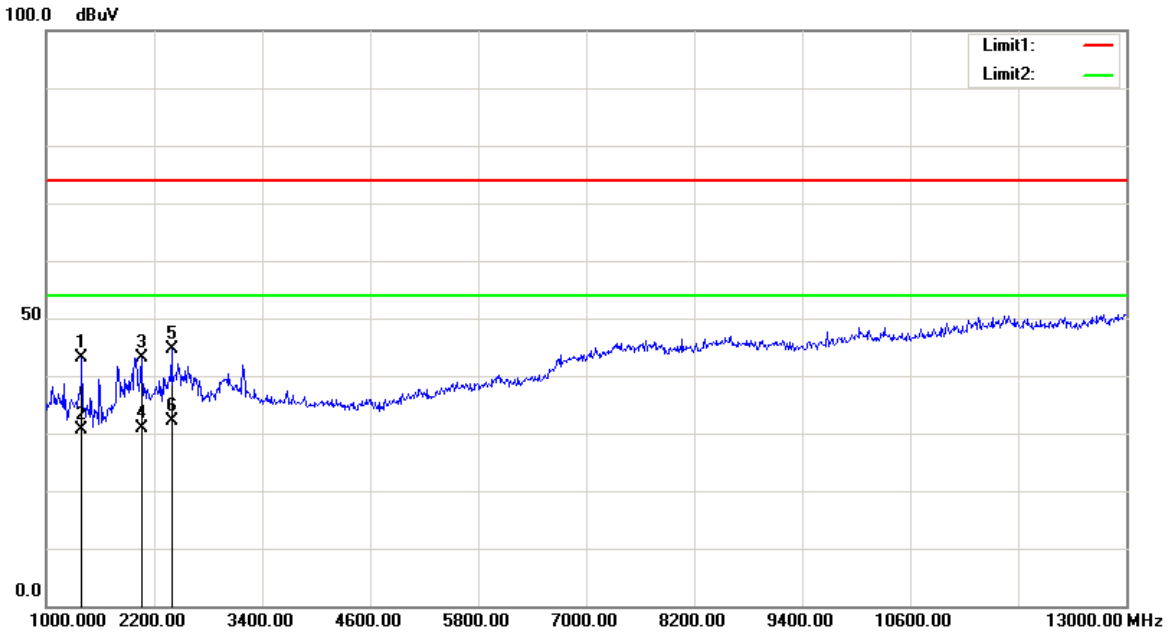



| Frequency (MHz) | Receiver Reading (dBµV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 107.6000 | 43.92 | QP | -7.72 | 36.20 | 43.50 | 7.30 |
| 119.2400 | 40.45 | QP | -5.75 | 34.70 | 43.50 | 8.80 |
| 167.7400 | 42.83 | QP | -7.73 | 35.10 | 43.50 | 8.40 |
| 179.3800 | 48.00 | QP | -8.30 | 39.70 | 43.50 | 3.80 |
| 252.1300 | 43.43 | QP | -7.73 | 35.70 | 46.00 | 10.30 |
| 624.6100 | 35.25 | QP | -0.05 | 35.20 | 46.00 | 10.80 |

**2) Above 1GHz:**

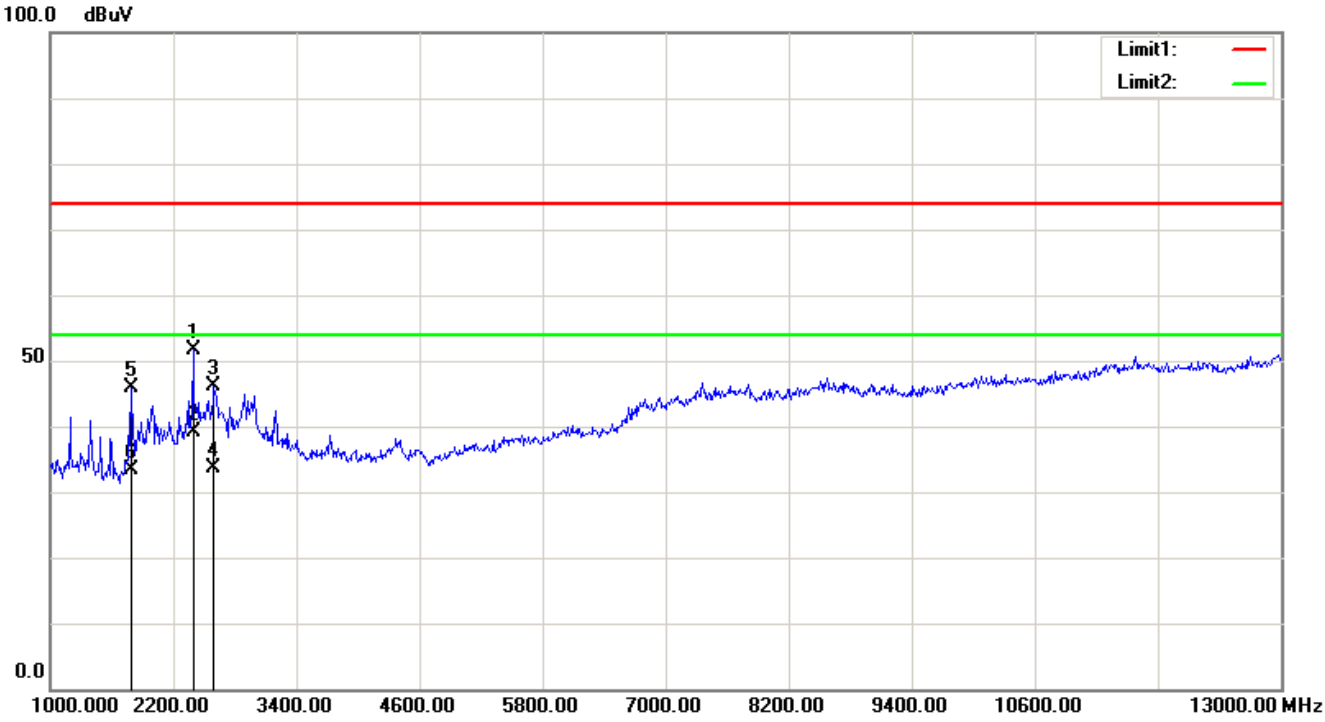
*Test Mode: Downloading*

**Horizontal**




| Frequency (MHz) | Receiver Reading (dBµV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 1396.000 | 43.91 | peak | -0.88 | 43.03 | 74.00 | 30.97 |
| 1396.000 | 31.47 | AVG | -0.88 | 30.59 | 54.00 | 23.41 |
| 2062.000 | 42.49 | peak | 0.71 | 43.20 | 74.00 | 30.80 |
| 2062.000 | 30.08 | AVG | 0.71 | 30.79 | 54.00 | 23.21 |
| 2392.000 | 42.78 | peak | 1.80 | 44.58 | 74.00 | 29.42 |
| 2392.000 | 30.21 | AVG | 1.80 | 32.01 | 54.00 | 21.99 |

**Vertical**




| Frequency (MHz) | Receiver Reading (dBµV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 2392.000 | 49.79 | peak | 1.80 | 51.59 | 74.00 | 22.41 |
| 2392.000 | 37.22 | AVG | 1.80 | 39.02 | 54.00 | 14.98 |
| 2596.000 | 43.00 | peak | 3.13 | 46.13 | 74.00 | 27.87 |
| 2596.000 | 30.52 | AVG | 3.13 | 33.65 | 54.00 | 20.35 |
| 1792.000 | 46.67 | peak | -0.69 | 45.98 | 74.00 | 28.02 |
| 1792.000 | 34.12 | AVG | -0.69 | 33.43 | 54.00 | 20.57 |

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