



## FCC PART 15.249

### TEST REPORT

For

**ALATECH Technology Limited**

39F., No. 758, Jungming S.RD. Taichung, Taiwan

**FCC ID: YQOWB001**

|   |                                       |
|---|---------------------------------------|
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| <b>Report Producer:</b>   | Kaylee Chiang<br><i>Kaylee Chiang</i> |
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

## Revision History

| Revision | No.           | Report Number     | Issue Date | Description     | Author/<br>Revised by |
|----------|---------------|-------------------|------------|-----------------|-----------------------|
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## GENERAL INFORMATION

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

**Applicant :** ALATECH Technology Limited

39F., No. 758, Jungming S. RD. Taichung, Taiwan

**Manufacturer :** ZHEJIANG ALA FITNESS TECHNOLOGY LTD

NO.405 Tongxin Road, Tongxiang Economic Development  
Zhejiang 314500, China

**Product :** Star ONE

**Model :** WB001

**Trade Name :** ALATECH

**Frequency Range :** 2457 MHz

**Antenna Specification :** Monopole Antenna/Gain: 2.08 dBi

**Voltage Range :** 3.7Vdc from battery

**Date of Test :** Jul. 18, 2017 ~ Sep. 22, 2017

*\*All measurement and test data in this report was gathered from production sample serial number: 170707003*

*(Assigned by BACL, Taiwan) The EUT supplied by the applicant was received on 2017-07-04.*

### Objective

This report is prepared on behalf of *ALATECH Technology Limited* in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the ANT+ mode of EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

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

FCC Part 15.247 DTS submission with FCC ID: YQOWB001

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on

☒ 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

☐ 68-3, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (Taiwan) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3180) and the FCC designation No.TW3180 under the Mutual Recognition Agreement (MRA) in FCC Test. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 974454. 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 an engineering mode, which was provided by manufacturer. The engineering mode was configured the system transmitting with maximum power. For ANT+ mode, only 1 channel (2457MHz) was used.

### EUT Exercise Software

No test software was used.

### Equipment Modifications

No modification was made to the EUT.

### Support Equipment List and Details

| Description | Manufacturer | Model Number | BSMI | FCC ID/DOC | S/N         |
|-------------|--------------|--------------|------|------------|-------------|
| NB          | DELL         | E6410        | N/A  | PD98260NGU | 10912240367 |

### External Cable List and Details

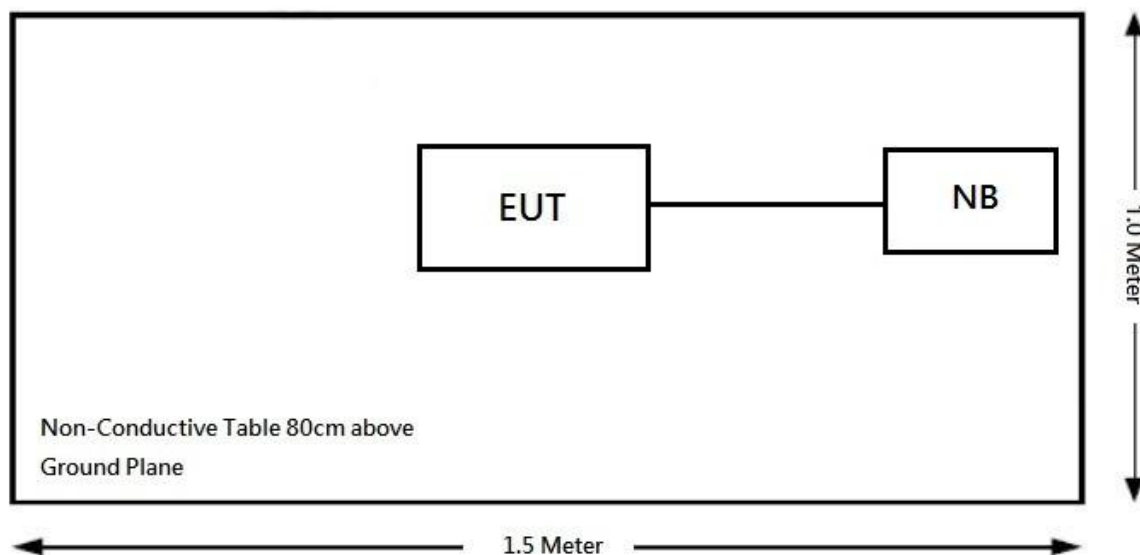
| Cable Description | Length (m) | From | To  |
|-------------------|------------|------|-----|
| Mini USB Cable    | 1.5        | NB   | EUT |

**Block Diagram of Test Setup**

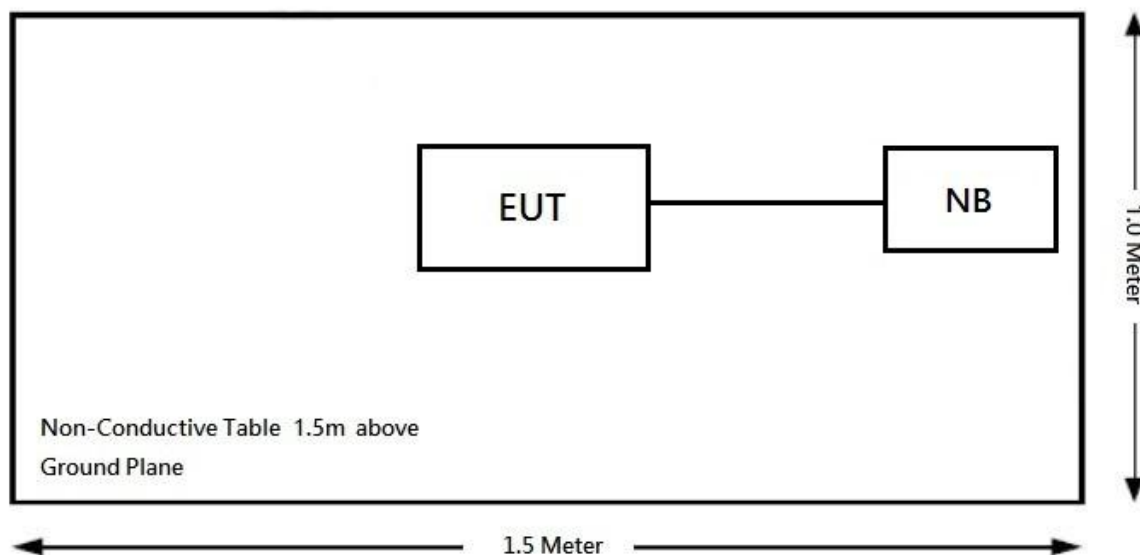
See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment

**Radiation:**

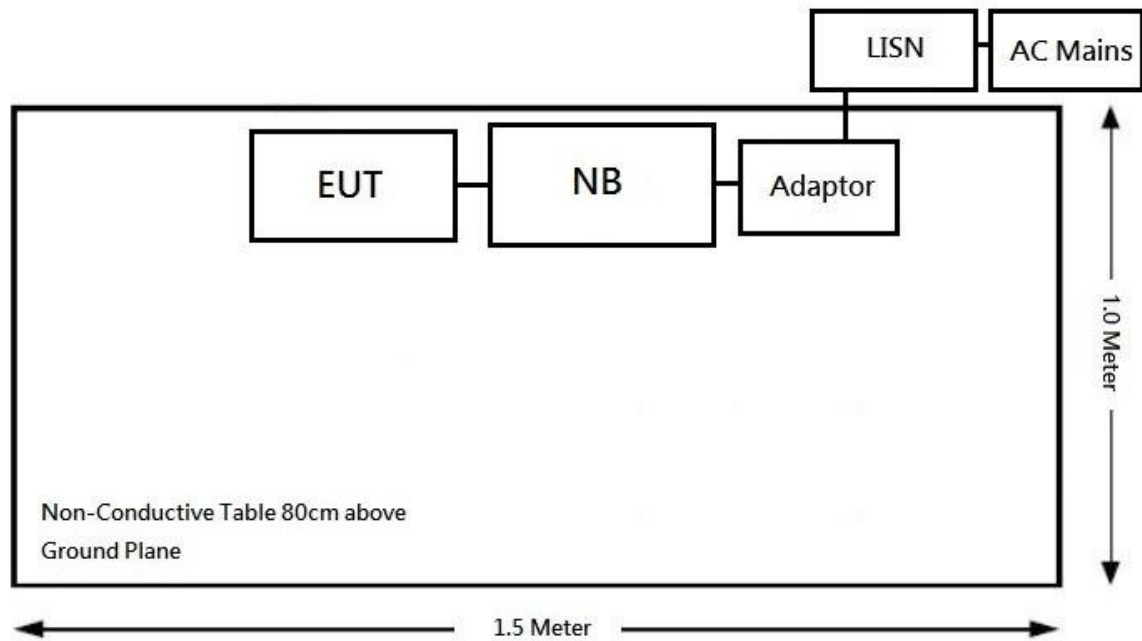
Below 1GHz:



Above 1GHz:



**Conduction:**





## SUMMARY OF TEST RESULTS

| FCC Rules                 | Description of Test         | Results    |
|---------------------------|-----------------------------|------------|
| §15.203                   | Antenna Requirement         | Compliance |
| §15.207 (a)               | AC Line Conducted Emissions | Compliance |
| §15.205, §15.209, §15.249 | Radiated Emissions          | Compliance |
| §15.215 (c)               | 20 dB Emission Bandwidth    | Compliance |

## **FCC §15.203 – ANTENNA REQUIREMENT**

### **Applicable Standard**

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

### **Antenna Connector Construction**

| Manufacturer               | Type             | Antenna Gain | Result     |
|----------------------------|------------------|--------------|------------|
| Alatech Technology Limited | monopole Antenna | 2.08 dBi     | Compliance |

**Result:** Compliance.

## FCC §15.207 - AC LINE CONDUCTED EMISSIONS

### Applicable Standard

According to FCC §15.207 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

| Frequency of Emission<br>(MHz) | Conducted Limit (dBuV)     |                            |
|--------------------------------|----------------------------|----------------------------|
|                                | Quasi-Peak                 | Average                    |
| 0.15-0.5                       | 66 to 56 <sup>Note 1</sup> | 56 to 46 <sup>Note 2</sup> |
| 0.5-5                          | 56                         | 46                         |
| 5-30                           | 60                         | 50                         |

*Note 1: Decreases with the logarithm of the frequency.*

*Note 2: A linear average detector is required*

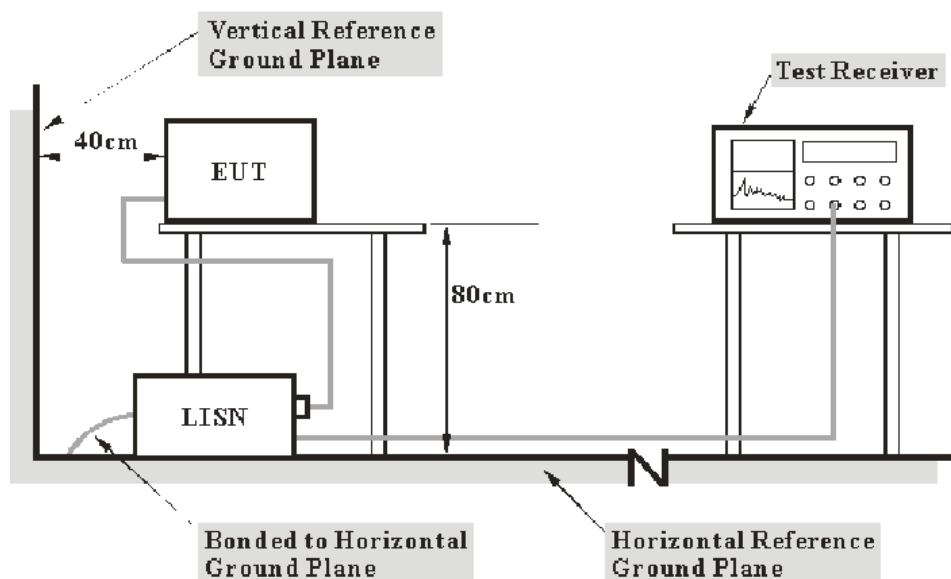
### Measurement Uncertainty

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

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

| Port     | Expanded Measurement uncertainty       |
|----------|--|
| AC Mains | 4.64 dB (k=2, 95% level of confidence) |

## 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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

## 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 Procedure

During the conducted emission test, the adapter was connected to the outlet of the 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 Factor & Margin Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

$$\text{Over Limit} = \text{Level} - \text{Limit Line}$$

### Test Equipment List and Details

| Manufacturers     | Descriptions    | Models  | Serial Numbers | Calibration Date | Calibration Due Date |
|-------------------|-----------------|---------|----------------|------------------|----------------------|
| LISN              | Rohde & Schwarz | ENV216  | 101248         | 2017/07/20       | 2018/07/19           |
| LISN              | EMCO            | 3816/2  | 75848          | 2017/08/02       | 2018/08/01           |
| EMI Test Receiver | Rohde & Schwarz | ESCI    | 100540         | 2017/05/24       | 2018/05/23           |
| Pulse Limiter     | Rohde & Schwarz | ESH3Z2  | TXZEM025       | 2017/08/11       | 2018/08/10           |
| RF Cable          | EMEC            | EM-CB5D | 001            | 2017/07/24       | 2018/07/23           |
| Software          | AUDIX           | E3      | V9.150826k     | NCR              | N.C.R                |

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

### Test Environmental Conditions

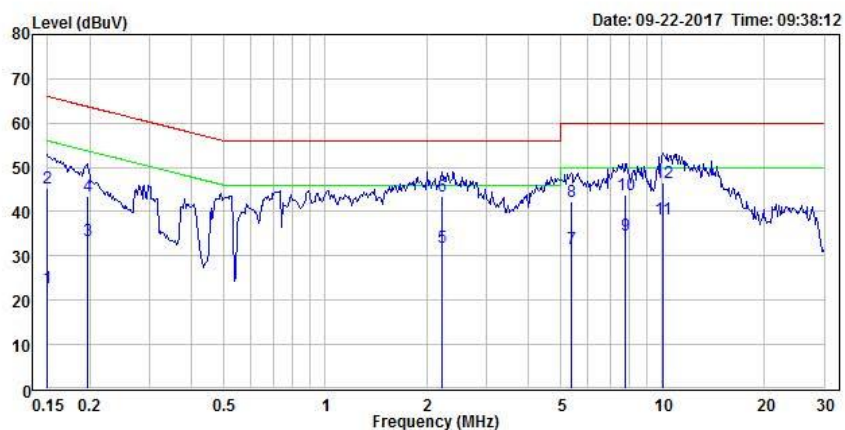
|                    |          |
|--------------------|----------|
| Temperature:       | 25 °C    |
| Relative Humidity: | 58 %     |
| ATM Pressure:      | 1020 hPa |

The testing was performed by Andy Shih on 2017-09-22.

### Test Results

Test Mode: Charge+ Transmitting

Please refer to the following plots and tables.

**Main: AC 120V/60 Hz, Line**

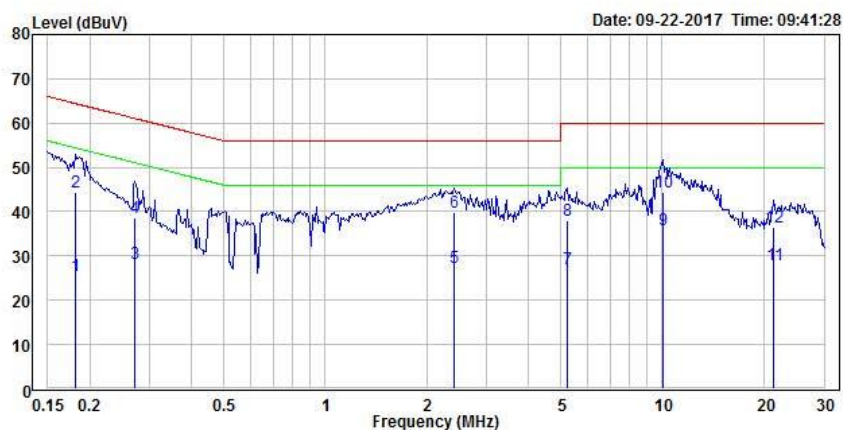
Condition: Line

EUT :

Mode :

Note :

|    | Freq   | Level | Limit | Over   | Read   |       |           |
|----|--------|-------|-------|--------|--------|-------|-----------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark    |
|    | MHz    | dBuV  | dBuV  | dB     | dB     | dBuV  | Pol/Phase |
| 1  | 0.150  | 22.91 | 56.00 | -33.09 | 19.50  | 3.41  | Average   |
| 2  | 0.150  | 45.31 | 66.00 | -20.69 | 19.50  | 25.81 | QP        |
| 3  | 0.197  | 33.48 | 53.75 | -20.27 | 19.50  | 13.98 | Average   |
| 4  | 0.197  | 43.49 | 63.75 | -20.26 | 19.50  | 23.99 | QP        |
| 5  | 2.216  | 31.96 | 46.00 | -14.04 | 19.59  | 12.37 | Average   |
| 6  | 2.216  | 43.45 | 56.00 | -12.55 | 19.59  | 23.86 | QP        |
| 7  | 5.367  | 31.72 | 50.00 | -18.28 | 19.68  | 12.04 | Average   |
| 8  | 5.367  | 42.20 | 60.00 | -17.80 | 19.68  | 22.52 | QP        |
| 9  | 7.805  | 34.73 | 50.00 | -15.27 | 19.73  | 15.00 | Average   |
| 10 | 7.805  | 43.84 | 60.00 | -16.16 | 19.73  | 24.11 | QP        |
| 11 | 10.071 | 38.33 | 50.00 | -11.67 | 19.76  | 18.57 | Average   |
| 12 | 10.071 | 46.46 | 60.00 | -13.54 | 19.76  | 26.70 | QP        |

**Main: AC 120V/60 Hz, Neutral**

Condition: Neutral

EUT :

Mode :

Note :

|    | Freq   | Level | Limit | Over   |        | Read  |         |           |
|----|--------|-------|-------|--------|--------|-------|---------|-----------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark  | Pol/Phase |
|    |        |       | dBuV  | dB     | dB     | dBuV  |         |           |
| 1  | 0.182  | 25.65 | 54.41 | -28.76 | 19.63  | 6.02  | Average | Neutral   |
| 2  | 0.182  | 44.36 | 64.41 | -20.05 | 19.63  | 24.73 | QP      | Neutral   |
| 3  | 0.273  | 28.28 | 51.04 | -22.76 | 19.63  | 8.65  | Average | Neutral   |
| 4  | 0.273  | 38.64 | 61.04 | -22.40 | 19.63  | 19.01 | QP      | Neutral   |
| 5  | 2.419  | 27.23 | 46.00 | -18.77 | 19.73  | 7.50  | Average | Neutral   |
| 6  | 2.419  | 39.94 | 56.00 | -16.06 | 19.73  | 20.21 | QP      | Neutral   |
| 7  | 5.240  | 26.96 | 50.00 | -23.04 | 19.82  | 7.14  | Average | Neutral   |
| 8  | 5.240  | 37.93 | 60.00 | -22.07 | 19.82  | 18.11 | QP      | Neutral   |
| 9  | 10.071 | 36.02 | 50.00 | -13.98 | 19.91  | 16.11 | Average | Neutral   |
| 10 | 10.071 | 44.36 | 60.00 | -15.64 | 19.91  | 24.45 | QP      | Neutral   |
| 11 | 21.298 | 27.96 | 50.00 | -22.04 | 20.06  | 7.90  | Average | Neutral   |
| 12 | 21.298 | 36.52 | 60.00 | -23.48 | 20.06  | 16.46 | QP      | Neutral   |

## FCC§15.209, §15.205 & §15.249 - RADIATED EMISSIONS

### Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--|--|
| 902–928 MHz           | 50   | 500  |
| 2400–2483.5 MHz       | 50   | 500  |
| 5725–5875 MHz         | 50   | 500  |
| 24.0–24.25 GHz        | 250  | 2500   |

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

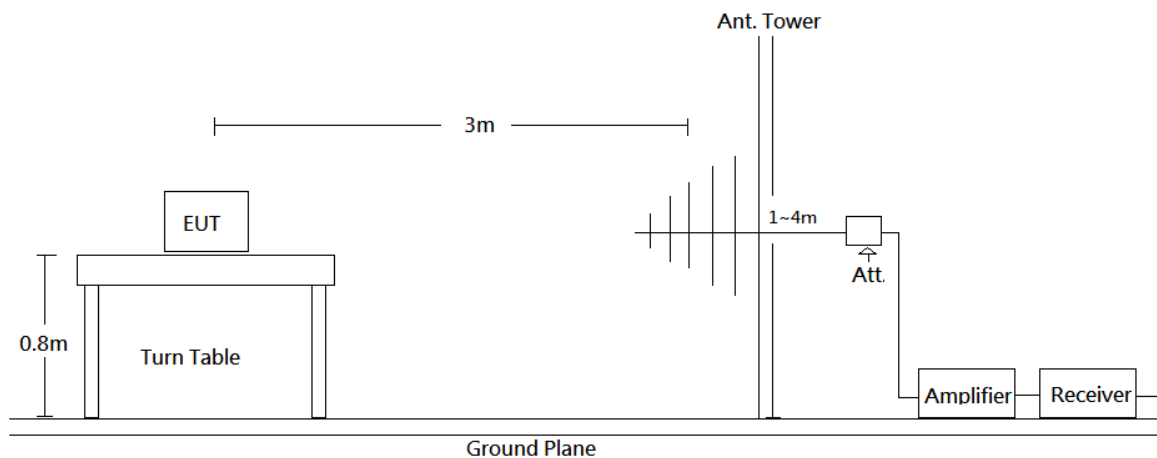
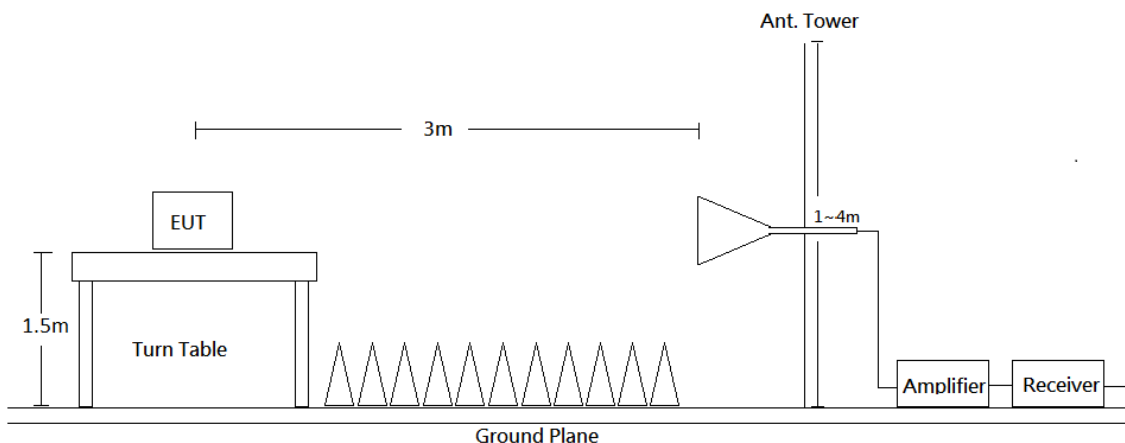
### Measurement Uncertainty

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

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

| Frequency      | Measurement uncertainty                |
|----------------|--|
| 30 MHz~200 MHz | 3.76 dB (k=2, 95% level of confidence) |
| 200 MHz~1 GHz  | 4.12 dB (k=2, 95% level of confidence) |
| 1 GHz~6 GHz    | 4.84 dB (k=2, 95% level of confidence) |
| 6 GHz~18 GHz   | 5.16 dB (k=2, 95% level of confidence) |
| 18 GHz~26 GHz  | 4.84 dB (k=2, 95% level of confidence) |
| 26 GHz~40 GHz  | 4.30 dB (k=2, 95% level of confidence) |



**EUT Setup****Below 1GHz:****Above 1GHz:**

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

**EMI Test Receiver & Spectrum Analyzer Setup**

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

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

### Test Procedure

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

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

### Test Equipment List and Details

| Description       | Manufacturer          | Model                    | Serial Number       | Calibration Date | Calibration Due Date |
|-------------------|-----------------------|--------------------------|---------------------|------------------|----------------------|
| 966A Room         |                       |                          |                     |                  |                      |
| Bilog Antenna     | Sunol & Mini-Circuits | JB6/UNAT-6+              | A050115 / 15542_01  | 2016/11/16       | 2017/11/15           |
| Horn Antenna      | EMCO                  | 3115                     | 9311-4158           | 2017/05/31       | 2018/05/30           |
| Horn Antenna      | ETS-Lindgren          | 3116                     | 00062638            | 2016/09/05       | 2017/09/04           |
| Preamplifier      | Sonoma                | 310N                     | 130602              | 2017/07/03       | 2018/07/02           |
| Preamplifier      | EMEC                  | EM01G18G                 | 060697              | 2017/04/14       | 2018/04/16           |
| Preamplifier      | EMEC                  | EM18G40G                 | 060656              | 2016/12/13       | 2017/12/12           |
| EMI Test Receiver | R & S                 | ESR7                     | 101419              | 2016/11/03       | 2017/11/03           |
| Spectrum Analyzer | Rohde & Schwarz       | FSV40                    | 101203              | 2017/07/13       | 2018/07/12           |
| Microflex Cable   | UTIFLEX               | UFB311A-Q-1440-300300    | 220490-006          | 2016/11/02       | 2017/11/01           |
| Microflex Cable   | UTIFLEX               | UFA210A-1-3149-300300    | MFR64639 226389-001 | 2016/11/29       | 2017/11/28           |
| Microflex Cable   | ROSNOL                | K1K50-UP0264-K1K50-450CM | 160309-1            | 2017/03/24       | 2018/03/23           |
| Microflex Cable   | ROSNOL                | K1K50-UP0264-K1K50-80CM  | 160309-2            | 2017/01/20       | 2018/01/19           |
| Turn Table        | Champro               | TT-2000                  | 060772-T            | N.C.R            | N.C.R                |
| Antenna Tower     | Champro               | AM-BS-4500-B             | 060772-A            | N.C.R            | N.C.R                |
| Controller        | Champro               | EM1000                   | 060772              | N.C.R            | N.C.R                |
| Software          | Farad                 | EZ_EMC                   | BACL-03A1           | N.C.R            | N.C.R                |

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

### Corrected Amplitude & Margin Calculation

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

$$\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Attenuator}$$

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:

$$\text{Margin} = \text{Result} - \text{Limit}$$

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.249.

### Test Environmental Conditions

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 25 °C    |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 1010 hPa |

*The testing was performed by Andy Shih on 2017-07-31.*

**Test Results***(Pre-scan with three orthogonal axis, and worse case as Y axis.)*

Mode: Transmitting

**Horizontal**

| Frequency | Reading      | Correct      | Result         | Limit          | Margin | Height | Degree | Remark |
|-----------|--------------|--------------|----------------|----------------|--------|--------|--------|--------|
| (MHz)     | (dB $\mu$ V) | Factor(dB/m) | (dB $\mu$ V/m) | (dB $\mu$ V/m) | (dB)   | (cm)   | ( ° )  |        |
| 268.62    | 28.38        | -10.46       | 17.92          | 46.00          | -28.08 | 100    | 94     | QP     |
| 402.48    | 27.78        | -7.67        | 20.11          | 46.00          | -25.89 | 100    | 269    | QP     |
| 527.61    | 28.12        | -5.32        | 22.80          | 46.00          | -23.20 | 100    | 146    | QP     |
| 651.77    | 27.77        | -3.34        | 24.43          | 46.00          | -21.57 | 100    | 125    | QP     |
| 830.25    | 28.13        | 0.03         | 28.16          | 46.00          | -17.84 | 100    | 26     | QP     |
| 973.81    | 27.23        | 3.26         | 30.49          | 54.00          | -23.51 | 100    | 352    | QP     |
| 2390.00   | 53.09        | -4.89        | 48.20          | 74.00          | -25.80 | 165    | 317    | peak   |
| 2390.00   | 39.13        | -4.89        | 34.24          | 54.00          | -19.76 | 165    | 317    | AVG    |
| 2400.00   | 52.00        | -4.87        | 47.13          | 74.00          | -26.87 | 160    | 322    | peak   |
| 2400.00   | 37.11        | -4.87        | 32.24          | 54.00          | -21.76 | 160    | 322    | AVG    |
| 2457.00   | 89.58        | -4.74        | 84.84          | 114.00         | -29.16 | 165    | 351    | peak   |
| 2457.00   | 61.79        | -4.74        | 57.05          | 94.00          | -36.95 | 165    | 351    | AVG    |
| 2483.50   | 58.84        | -4.69        | 54.15          | 74.00          | -19.85 | 165    | 125    | peak   |
| 2483.50   | 43.85        | -4.69        | 39.16          | 54.00          | -14.84 | 165    | 125    | AVG    |
| 4914.00   | 46.86        | 1.35         | 48.21          | 74.00          | -25.79 | 112    | 160    | peak   |
| 4914.00   | 39.01        | 1.35         | 40.36          | 54.00          | -13.64 | 112    | 160    | AVG    |
| 7371.00   | 45.51        | 7.21         | 52.72          | 74.00          | -21.28 | 129    | 315    | peak   |
| 7371.00   | 30.24        | 7.21         | 37.45          | 54.00          | -16.55 | 129    | 315    | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

**Vertical**

| Frequency | Reading      | Correct      | Result         | Limit          | Margin | Height | Degree | Remark |
|-----------|--------------|--------------|----------------|----------------|--------|--------|--------|--------|
| (MHz)     | (dB $\mu$ V) | Factor(dB/m) | (dB $\mu$ V/m) | (dB $\mu$ V/m) | (dB)   | (cm)   | ( ° )  |        |
| 97.90     | 35.55        | -15.06       | 20.49          | 43.50          | -23.01 | 100    | 93     | QP     |
| 166.77    | 30.36        | -11.98       | 18.38          | 43.50          | -25.12 | 100    | 300    | QP     |
| 199.75    | 28.13        | -10.76       | 17.37          | 43.50          | -26.13 | 100    | 318    | QP     |
| 314.21    | 30.54        | -9.54        | 21.00          | 46.00          | -25.00 | 100    | 122    | QP     |
| 579.99    | 28.68        | -4.38        | 24.30          | 46.00          | -21.70 | 100    | 67     | QP     |
| 865.17    | 28.65        | 0.71         | 29.36          | 46.00          | -16.64 | 100    | 281    | QP     |
| 2390.00   | 53.38        | -4.89        | 48.49          | 74.00          | -25.51 | 125    | 111    | peak   |
| 2390.00   | 39.21        | -4.89        | 34.32          | 54.00          | -19.68 | 125    | 111    | AVG    |
| 2400.00   | 51.53        | -4.87        | 46.66          | 74.00          | -27.34 | 129    | 133    | peak   |
| 2400.00   | 37.85        | -4.87        | 32.98          | 54.00          | -21.02 | 129    | 133    | AVG    |
| 2457.00   | 88.55        | -4.74        | 83.81          | 114.00         | -30.19 | 125    | 120    | peak   |
| 2457.00   | 61.33        | -4.74        | 56.59          | 94.00          | -37.41 | 125    | 120    | AVG    |
| 2483.50   | 53.49        | -4.69        | 48.80          | 74.00          | -25.20 | 125    | 271    | peak   |
| 2483.50   | 39.24        | -4.69        | 34.55          | 54.00          | -19.45 | 125    | 271    | AVG    |
| 4914.00   | 45.67        | 1.35         | 47.02          | 74.00          | -26.98 | 177    | 308    | peak   |
| 4914.00   | 36.19        | 1.35         | 37.54          | 54.00          | -16.46 | 177    | 308    | AVG    |
| 7371.00   | 44.94        | 7.21         | 52.15          | 74.00          | -21.85 | 143    | 15     | peak   |
| 7371.00   | 29.90        | 7.21         | 37.11          | 54.00          | -16.89 | 143    | 15     | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

## FCC§15.215(c) – 20 dB BANDWIDTH TESTING

### Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

### Test Equipment List and Details

| Description       | Manufacturer    | Model     | Serial Number | Calibration Date | Calibration Due Date |
|-------------------|-----------------|-----------|---------------|------------------|----------------------|
| Spectrum Analyzer | Rohde & Schwarz | FSEK30    | 825084/006    | 2016/12/15       | 2017/12/14           |
| Cable             | WOKEN           | SFL402    | S02-160323-07 | 2017/02/22       | 2018/02/21           |
| Attenuator        | MINI-CIRCUITS   | BW-S10W5+ | N/A           | 2017/3/14        | 2018/3/13            |

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

### Test Environmental Conditions

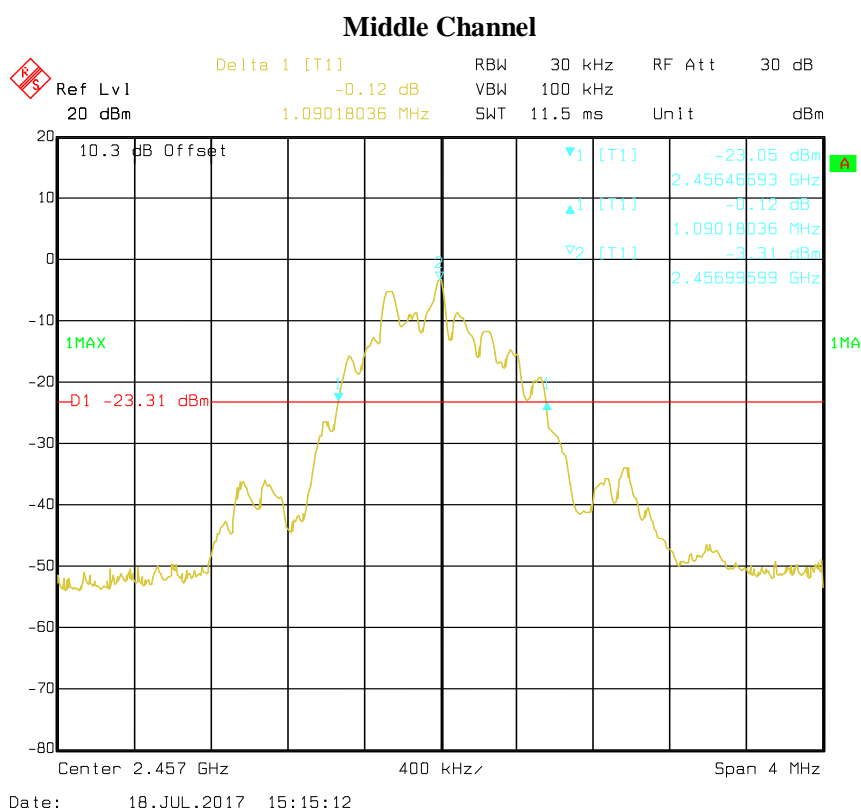
|                    |          |
|--------------------|----------|
| Temperature:       | 25 °C    |
| Relative Humidity: | 55 %     |
| ATM Pressure:      | 1010 hPa |

*The testing was performed by Andy Shih on 2017-07-18.*

**Test Results***Test Mode: Transmitting*

| Channel | Frequency<br>(MHz) | 20 dB Emission Bandwidth<br>(MHz) |
|---------|--------------------|-----------------------------------|
| Middle  | 2457               | 1.090                             |

Please refer to the following tables and plots.

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