

**IEEE C95.1**

**KDB 447498 D01 v06**

**47 C.F.R. Part 1, Subpart I, Section 1.1310**

**47 C.F.R. Part 2, Subpart J, Section 2.1091**

**RF EXPOSURE REPORT**

**For**

**IP Phone**

**Model: OBi2182**

**Data Applies To: OBi2162**

**Trade Name: OBIHAI**

**Issued for**

**Obihai Technology, Inc.**

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**Issued by**

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## Revision History

| Rev. | Issue Date | Revisions     | Effect Page | Revised By   |
|------|------------|---------------|-------------|--------------|
| 00   | 12/15/2017 | Initial Issue | All Page    | Gloria Chang |
|      |            |               |             |              |
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## 1. TEST REPORT CERTIFICATION

### We hereby certify that:

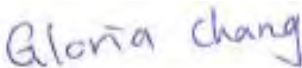
The equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirement of the applicable standards. The test record, data evaluation and Equipment under Test (EUT) configurations represented herein are true and accurate accounts of the measurement of the sample's RF characteristics under the conditions specified in this report.

| APPLICABLE STANDARD                                                                                                            |                         |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Standard                                                                                                                       | Test Result             |
| IEEE C95.1<br>KDB 447498 D01 v06<br>47 C.F.R. Part 1, Subpart I, Section 1.1310<br>47 C.F.R. Part 2, Subpart J, Section 2.1091 | No non-compliance noted |

**Approved by:**

**Prepared by:**

  
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\_\_\_\_\_  
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Report coordinator

## 2. Limit

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

## 3. EUT Specification

|                                   |                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product Name</b>               | IP Phone                                                                                                                                                                                                                                                                                                                                                |
| <b>Model Number</b>               | OBI2182                                                                                                                                                                                                                                                                                                                                                 |
| <b>Data Applies To</b>            | OBI2162                                                                                                                                                                                                                                                                                                                                                 |
| <b>Identify Number</b>            | T170919S08                                                                                                                                                                                                                                                                                                                                              |
| <b>Received Date</b>              | September 19, 2017                                                                                                                                                                                                                                                                                                                                      |
| <b>Frequency band (Operating)</b> | IEEE 802.11b/g/gn HT20 Mode: 2412MHz ~ 2462MHz<br>IEEE 802.11gn HT40 Mode: 2422MHz ~ 2452MHz<br>IEEE 802.11a, 802.11ac VHT20 Mode: 5180 MHz ~ 5240 MHz / 5745 MHz ~ 5825 MHz<br>IEEE 802.11ac VHT40 Mode: 5190 MHz ~ 5230 MHz / 5755 MHz ~ 5795 MHz<br>IEEE 802.11ac VHT80 Mode: 5210 MHz / 5775 MHz<br>Bluetooth 2.1 + EDR / 4.0 Mode: 2402 ~ 2480 MHz |
| <b>Device category</b>            | Mobile (>20cm separation)                                                                                                                                                                                                                                                                                                                               |
| <b>Exposure classification</b>    | <input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )                                                                                                                                                           |
| <b>Antenna Specification</b>      | WiFi 2.4GHz Antenna, Gain: 2.68dBi<br>WiFi 5GHz Antenna, Gain: 4.25dBi<br>Bluetooth Antenna, Gain: 2.68dBi                                                                                                                                                                                                                                              |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maximum average output power</b> | IEEE 802.11b Mode: 20.60 dBm<br>IEEE 802.11g Mode: 17.55 dBm<br>IEEE 802.11gn HT20 MCS0 Mode: 17.58 dBm<br>IEEE 802.11gn HT40 MCS0 Mode: 15.36 dBm<br>UNII Band 1:<br>IEEE 802.11a Mode: 11.60 dBm<br>IEEE 802.11ac VHT20 NSS1/MCS0 Mode: 11.64 dBm<br>IEEE 802.11ac VHT40 NSS1/MCS0 Mode: 12.47 dBm<br>IEEE 802.11ac VHT80 NSS1/MCS0 Mode: 9.73 dBm<br>UNII Band 3:<br>IEEE 802.11a Mode: 15.21 dBm<br>IEEE 802.11ac VHT20 NSS1/MCS0 Mode: 15.13 dBm<br>IEEE 802.11ac VHT40 NSS1/MCS0 Mode: 15.23 dBm<br>IEEE 802.11ac VHT80 NSS1/MCS0 Mode: 14.86 dBm<br>Bluetooth 2.1+EDR Mode: 4.47 dBm<br>Bluetooth 4.0 Mode: 4.50 dBm |
| <b>Evaluation applied</b>           | MPE Evaluation*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Remark:**

1. For more details, please refer to the User's manual of the EUT.
2. This submittal(s) (test report) is intended for FCC ID: 2ADXF-OBI2182 filing.

#### 4. Test Results

*No non-compliance noted.*

##### **Calculation**

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

*Where         $E$  = Field strength in Volts / meter*

*$P$  = Power in Watts*

*$G$  = Numeric antenna gain*

*$d$  = Distance in meters*

*$S$  = Power density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P / 1000) \times G}{377 \times (d / 100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \textbf{Equation 1}$$

*Where         $d$  = Distance in cm*

*$P$  = Power in mW*

*$G$  = Numeric antenna gain*

*$S$  = Power density in mW / cm<sup>2</sup>*

## 5. Maximum Permissible Exposure

Substituting the MPE safe distance using  $d = 20$  cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where

$P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

| Mode                          | Frequency (MHz) | Power (dBm) | Ant. Gain (dBi) | Distance (cm) | Power density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-------------------------------|-----------------|-------------|-----------------|---------------|-------------------------------------|-----------------------------|
| IEEE 802.11b                  | 2437            | 20.60       | 2.68            | 20            | 0.0423                              | 1                           |
| IEEE 802.11g                  | 2437            | 17.55       | 2.68            | 20            | 0.021                               | 1                           |
| IEEE 802.11gn HT20 MCS0       | 2437            | 17.58       | 2.68            | 20            | 0.0211                              | 1                           |
| IEEE 802.11gn HT40 MCS0       | 2437            | 15.36       | 2.68            | 20            | 0.0127                              | 1                           |
| UNII Band 1                   |                 |             |                 |               |                                     |                             |
| IEEE 802.11a                  | 5240            | 11.60       | 4.25            | 20            | 0.0077                              | 1                           |
| IEEE 802.11ac VHT20 NSS1/MCS0 | 5180            | 11.64       | 4.25            | 20            | 0.0077                              | 1                           |
| IEEE 802.11ac VHT40 NSS1/MCS0 | 5230            | 12.47       | 4.25            | 20            | 0.0093                              | 1                           |
| IEEE 802.11ac VHT80 NSS1/MCS0 | 5210            | 9.73        | 4.25            | 20            | 0.005                               | 1                           |
| UNII Band 3                   |                 |             |                 |               |                                     |                             |
| IEEE 802.11a                  | 5825            | 15.21       | 4.25            | 20            | 0.0176                              | 1                           |
| IEEE 802.11ac VHT20 NSS1/MCS0 | 5825            | 15.13       | 4.25            | 20            | 0.0172                              | 1                           |
| IEEE 802.11ac VHT40 NSS1/MCS0 | 5795            | 15.23       | 4.25            | 20            | 0.0176                              | 1                           |
| IEEE 802.11ac VHT80 NSS1/MCS0 | 5775            | 14.86       | 4.25            | 20            | 0.0162                              | 1                           |
| Bluetooth 2.1+EDR             | 2480            | 4.47        | 2.68            | 20            | 0.001                               | 1                           |
| Bluetooth 4.0                 | 2402            | 4.50        | 2.68            | 20            | 0.001                               | 1                           |

### Simultaneously MPE

Simultaneously MPE = MPE 1 / Limit 1 + MPE 2 / Limit 2 + .....

### **2.4GHz + 5GHz Mode**

Simultaneously MPE = (0.0423 / 1) + (0.0176 / 1) = **0.0599 mW/cm<sup>2</sup>**