

# Maximum Permissible Exposure Evaluation

## FCC ID: 2A7ZM-ALTOX6

### 1. Client Information

|              |   |                                                                                                               |
|--------------|---|---------------------------------------------------------------------------------------------------------------|
| Applicant    | : | JBU GLOBAL LLC                                                                                                |
| Address      | : | 19416 NE 26th Ave, 114B, Miami, Florida 33180                                                                 |
| Manufacturer | : | GUANGZHOU MIAOSHENG ELECTRONIC TECHNOLOGY Co., LTD                                                            |
| Address      | : | 1-2, second floor West Street Watermelon Ridge Dongguan village Xinya Street Huadu District, Guangzhou, China |

### 2. General Description of EUT

|                     |                      |                                                                                                                                                                        |
|---------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT Name            | :                    | Alto X6                                                                                                                                                                |
| Model(s) No.        | :                    | Alto X6                                                                                                                                                                |
| Product Description | Operation Frequency: | Bluetooth V5.0: 2402MHz~2480MHz<br>802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz~2452MHz                                                                |
|                     | Number of Channel:   | Bluetooth 5.0(BDR+EDR): 79 channels<br>Bluetooth 5.0(BLE): 40 channels<br>802.11b/g/n(HT20): 11 channels<br>802.11n(HT40): 7 channels                                  |
|                     | RF Output Power:     | BLE: 1.311dBm (Max)<br>BT: 2.531dBm (Max)<br>802.11b: 17.575dBm (Max)<br>802.11g: 16.456dBm (Max)<br>802.11n (HT20): 18.028dBm (Max)<br>802.11n (HT40): 14.77dBm (Max) |
|                     | Antenna Gain:        | 2.3dBi FPC Antenna                                                                                                                                                     |
|                     | Modulation Type:     | GFSK, $\pi$ /4-DQPSK, 8-DPSK<br>802.11b: DSSS(CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM(BPSK, QPSK, 16QAM, 64QAM)                                                          |
| Power Supply        | :                    | For Adapter (Model: QD-POWER-GF-01)<br>Input: AC 110-240V 50/60Hz<br>Output: DC 15V 3500mA                                                                             |
| Software Version    | :                    | 5.3.0.0                                                                                                                                                                |
| Hardware Version    | :                    | T367-V1.8.1 P40-V2.1                                                                                                                                                   |

**Remark:** The antenna gain provided by the applicant, the adapter and verified for the RF conduction test and adapter provided by TOBY test lab.

**Note:** More test information about the EUT please refer the RF Test Report.

## MPE Calculations for WIFI

### 1. Antenna Gain:

FPC Antenna: 2.3dBi

### 2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

### 4. Test Result:

| Worst Maximum MPE Result |                 |             |                            |                    |                             |                    |                   |                                          |
|--------------------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|------------------------------------------|
| Mode                     | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ cm <sup>2</sup> ) [S] |
| GFSK                     | 1               | 2402        | 0.465                      | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |
|                          |                 | 2441        | 2.531                      | 3±1                | 4                           | 2.3                | 20                | 0.0008                                   |
|                          |                 | 2480        | 0.884                      | 1±1                | 2                           | 2.3                | 20                | 0.0005                                   |
| π/4-DQPSK                | 1               | 2402        | 0.319                      | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |
|                          |                 | 2441        | 1.326                      | 1±1                | 2                           | 2.3                | 20                | 0.0005                                   |
|                          |                 | 2480        | 0.25                       | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |
| 8-DPSK                   | 1               | 2402        | 0.27                       | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |
|                          |                 | 2441        | 1.647                      | 2±1                | 3                           | 2.3                | 20                | 0.0007                                   |
|                          |                 | 2480        | 0.432                      | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |
| BLE(1Mbps)               | 1               | 2402        | 1.311                      | 1±1                | 2                           | 2.3                | 20                | 0.0005                                   |
|                          |                 | 2440        | 1.012                      | 1±1                | 2                           | 2.3                | 20                | 0.0005                                   |
|                          |                 | 2480        | 0.161                      | 0±1                | 1                           | 2.3                | 20                | 0.0004                                   |

|               |   |      |        |            |    |     |    |        |
|---------------|---|------|--------|------------|----|-----|----|--------|
| 802.11b       | 1 | 2412 | 17.119 | $17 \pm 1$ | 18 | 2.3 | 20 | 0.0213 |
|               |   | 2437 | 17.224 | $17 \pm 1$ | 18 | 2.3 | 20 | 0.0213 |
|               |   | 2462 | 17.575 | $18 \pm 1$ | 19 | 2.3 | 20 | 0.0268 |
| 802.11g       | 1 | 2412 | 16.02  | $16 \pm 1$ | 17 | 2.3 | 20 | 0.0169 |
|               |   | 2437 | 16.339 | $16 \pm 1$ | 17 | 2.3 | 20 | 0.0169 |
|               |   | 2462 | 16.456 | $16 \pm 1$ | 17 | 2.3 | 20 | 0.0169 |
| 802.11n(HT20) | 1 | 2412 | 17.438 | $17 \pm 1$ | 18 | 2.3 | 20 | 0.0213 |
|               |   | 2437 | 17.569 | $18 \pm 1$ | 19 | 2.3 | 20 | 0.0268 |
|               |   | 2462 | 18.028 | $18 \pm 1$ | 19 | 2.3 | 20 | 0.0268 |
| 802.11n(HT40) | 1 | 2422 | 14.451 | $14 \pm 1$ | 15 | 2.3 | 20 | 0.0107 |
|               |   | 2437 | 14.367 | $14 \pm 1$ | 15 | 2.3 | 20 | 0.0107 |
|               |   | 2452 | 14.77  | $15 \pm 1$ | 16 | 2.3 | 20 | 0.0135 |

Note:

(1)  $N_{TX}$  = Number of Transmit Antennas

(2) RF Output power specifies that Maximum Conducted Peak Output Power.

## 5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

### Limits for General Population/ Uncontrolled Exposure

| Frequency Range (MHz) | Power density (mW/ cm <sup>2</sup> ) |
|-----------------------|--------------------------------------|
| 300-1,500             | F/1500                               |
| 1,500-100,000         | 1.0                                  |

For:2402~2480MHz&2412~2462MHz

MPE limit S: 1mW/ cm<sup>2</sup>

## 6. Summary simultaneous transmission results

WiFi and Bluetooth support simultaneous transmit the

| WIFI ANT1<br>MPE (Ratio) | Bluetooth<br>MPE ( Ratio ) | simultaneous<br>MPE<br>( Ratio ) | MPE Limits<br>( Ratio ) |
|--------------------------|----------------------------|----------------------------------|-------------------------|
| 0.0268                   | 0.0008                     | 0.0276                           | 1.0000                  |

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.

## 7. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----