

## FCC 47 CFR MPE REPORT

Linkplay Technology Inc.

Wireless Smart Audio Module

Model Number: A128

FCC ID: 2ANOG-A128

|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| Applicant:               | Linkplay Technology Inc.                                            |
| Address:                 | 8F-8036, Qianren Building, No.7, Yingcui Road, Jiangning District,  |
|                          | Nanjing, China                                                      |
|                          |                                                                     |
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|                 |                       |
|-----------------|-----------------------|
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|                      |                                                                                                                                  |                    |          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| <b>Applicant:</b>    | Linkplay Technology Inc.                                                                                                         |                    |          |
| <b>Address:</b>      | 8F-8036, Qianren Building, No.7, Yingcui Road, Jiangning District, Nanjing, China                                                |                    |          |
| <b>Manufacturer:</b> | Linkplay Technology Inc.                                                                                                         |                    |          |
| <b>Address:</b>      | 8F-8036, Qianren Building, No.7, Yingcui Road, Jiangning District, Nanjing, China                                                |                    |          |
| <b>Factory:</b>      | Shenzhen Compare Electronics Co., Ltd                                                                                            |                    |          |
| <b>Address:</b>      | 6F B Building, Jinhong Industrial Park, No.6 Third Industrial Zone, Jjuwei Community Hangcheng Street, Bao'an District, Shenzhen |                    |          |
| <b>E.U.T:</b>        | Wireless Smart Audio Module                                                                                                      |                    |          |
| <b>Model Number:</b> | A128                                                                                                                             | <b>Serial No.:</b> | 38e018f9 |
| <b>Power Supply:</b> | DC 5V From Adapter Input AC 100-240V, 50/60Hz                                                                                    |                    |          |

## Maximum Permissible Exposure

### 1. Applicable Standards

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 level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

#### 1.1. Limits for Maximum Permissible Exposure (MPE)

##### (a) Limits for Occupational/Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                  | 6                                                                      |
| 3.0-30                | 1842/f                            | 4.89/f                            | (900/f)*                                | 6                                                                      |
| 30-300                | 61.4                              | 0.163                             | 1.0                                     | 6                                                                      |
| 300-1500              |                                   |                                   | F/300                                   | 6                                                                      |
| 1500-10000            |                                   |                                   | 5                                       | 6                                                                      |

##### (b) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                  | 30                                                                     |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f)*                                | 30                                                                     |
| 30-300                | 27.5                              | 0.073                             | 0.2                                     | 30                                                                     |
| 300-1500              |                                   |                                   | F/1500                                  | 30                                                                     |
| 1500-10000            |                                   |                                   | 1.0                                     | 30                                                                     |

Note: f=frequency in MHz; \*Plane-wave equivalent power density

## 1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

## 2. Conducted Power Result

| Antenna | Mode<br>(MHz)           | Frequency<br>(MHz) | Peak output<br>power<br>(dBm) | Peak output<br>power<br>(mW) | Target<br>power<br>(dBm) |
|---------|-------------------------|--------------------|-------------------------------|------------------------------|--------------------------|
| 0       | GFSK 2M-BLE             | 2480               | 3.110                         | 2.046                        | 3±1                      |
| 0       | GFSK-Bluetooth          | 2480               | 3.020                         | 2.004                        | 3±1                      |
| 0       | IEEE 802.11b            | 2412               | 16.66                         | 46.345                       | 16±1                     |
| 0       | IEEE 802.11g            | 2412               | 20.70                         | 117.490                      | 20±1                     |
| 0       | IEEE 802.11n HT20(2.4G) | 2412               | 20.04                         | 100.925                      | 20±1                     |
| 0       | IEEE 802.11a            | 5200               | 13.60                         | 22.909                       | 13±1                     |
| 0       | IEEE 802.11n HT20(5G)   | 5745               | 13.22                         | 20.989                       | 13±1                     |
| 0       | IEEE 802.11ac VHT20(5G) | 5745               | 13.36                         | 21.677                       | 13±1                     |
| 1       | IEEE 802.11b            | 2412               | 17.50                         | 56.234                       | 17±1                     |
| 1       | IEEE 802.11g            | 2472               | 22.20                         | 165.959                      | 22±1                     |
| 1       | IEEE 802.11n HT20(2.4G) | 2412               | 21.42                         | 138.676                      | 21±1                     |
| 1       | IEEE 802.11a            | 5300               | 14.69                         | 29.444                       | 14±1                     |
| 1       | IEEE 802.11n HT20(5G)   | 5300               | 13.36                         | 21.677                       | 13±1                     |
| 1       | IEEE 802.11ac VHT20(5G) | 5825               | 13.05                         | 20.184                       | 13±1                     |
| 2       | IEEE 802.11a            | 5180               | 14.88                         | 30.761                       | 14±1                     |
| 2       | IEEE 802.11n HT20(5G)   | 5180               | 14.86                         | 30.620                       | 14±1                     |
| 2       | IEEE 802.11ac VHT20(5G) | 5745               | 14.93                         | 31.117                       | 14±1                     |

### 3. Calculated Result and Limit

#### Antenna 0

| Mode                | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|---------------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                     |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| 2.4G Band           |                    |              |          |                                         |                                                    |             |
| GFSK 2M-BLE         | 4                  | 3.51         | 2.244    | 0.0011                                  | 1                                                  | Complies    |
| GFSK-Bluetooth      | 4                  | 3.51         | 2.244    | 0.0011                                  | 1                                                  | Complies    |
| IEEE 802.11b        | 17                 | 3.51         | 2.244    | 0.0224                                  | 1                                                  | Complies    |
| IEEE 802.11g        | 21                 | 3.51         | 2.244    | 0.0562                                  | 1                                                  | Complies    |
| IEEE 802.11n HT20   | 21                 | 3.51         | 2.244    | 0.0562                                  | 1                                                  | Complies    |
| 5G Band             |                    |              |          |                                         |                                                    |             |
| IEEE 802.11a        | 14                 | 4.7          | 2.951    | 0.1475                                  | 1                                                  | Complies    |
| IEEE 802.11n HT20   | 14                 | 4.7          | 2.951    | 0.1475                                  | 1                                                  | Complies    |
| IEEE 802.11ac VHT20 | 14                 | 4.7          | 2.951    | 0.1475                                  | 1                                                  | Complies    |

**Antenna 1**

| Mode                | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|---------------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                     |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| 2.4G Band           |                    |              |          |                                         |                                                    |             |
| IEEE 802.11b        | 18                 | 3.76         | 2.377    | 0.0298                                  | 1                                                  | Complies    |
| IEEE 802.11g        | 23                 | 3.76         | 2.377    | 0.0943                                  | 1                                                  | Complies    |
| IEEE 802.11n HT20   | 22                 | 3.76         | 2.377    | 0.0749                                  | 1                                                  | Complies    |
| 5G Band             |                    |              |          |                                         |                                                    |             |
| IEEE 802.11a        | 15                 | 4.6          | 2.884    | 0.1693                                  | 1                                                  | Complies    |
| IEEE 802.11n HT20   | 14                 | 4.6          | 2.884    | 0.1441                                  | 1                                                  | Complies    |
| IEEE 802.11ac VHT20 | 14                 | 4.6          | 2.884    | 0.1441                                  | 1                                                  | Complies    |

**Antenna 2**

| Mode                | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|---------------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                     |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| 5G Band             |                    |              |          |                                         |                                                    |             |
| IEEE 802.11a        | 15                 | 5.45         | 3.508    | 0.2207                                  | 1                                                  | Complies    |
| IEEE 802.11n HT20   | 15                 | 5.45         | 3.508    | 0.2207                                  | 1                                                  | Complies    |
| IEEE 802.11ac VHT20 | 15                 | 5.45         | 3.508    | 0.2207                                  | 1                                                  | Complies    |

**Antenna 0+1**

| Mode                | Power Density (S) (mW/cm <sup>2</sup> )<br>Antenna 0 | Power Density (S) (mW/cm <sup>2</sup> )<br>Antenna 1 | Power Density (S) (mW/cm <sup>2</sup> )<br>Total | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|---------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|-------------|
| 2.4G Band           |                                                      |                                                      |                                                  |                                                    |             |
| IEEE 802.11n HT20   | 0.0562                                               | 0.0749                                               | 0.1311                                           | 1                                                  | Complies    |
| 5G Band             |                                                      |                                                      |                                                  |                                                    |             |
| IEEE 802.11n HT20   | 0.1475                                               | 0.1441                                               | 0.2916                                           | 1                                                  | Complies    |
| IEEE 802.11ac VHT20 | 0.1475                                               | 0.1441                                               | 0.2916                                           | 1                                                  | Complies    |

**Bluetooth+2.4G Wi-Fi+5G Wi-Fi ( ANT0+ANT1)+5G Wi-Fi(ANT2)**

| MAX<br>Power Density<br>(S)<br>(mW/cm <sup>2</sup> )<br>Bluetooth | MAX<br>Power Density<br>(S)<br>(mW/cm <sup>2</sup> )<br>2.4G Wi-Fi | MAX<br>Power Density<br>(S)<br>(mW/cm <sup>2</sup> )<br>5G Wi-Fi<br>ANT0+ANT1 | MAX<br>Power Density<br>(S)<br>(mW/cm <sup>2</sup> )<br>5G Wi-Fi<br>ANT2 | Power<br>Density<br>(S)<br>(mW/cm <sup>2</sup> )<br>Total | Limited of<br>Power<br>Density<br>(S)<br>(mW/cm <sup>2</sup> ) | Test Result |
|-------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------|-------------|
| 0.0011                                                            | 0.1311                                                             | 0.2916                                                                        | 0.2207                                                                   | 0.6455                                                    | 1                                                              | Complies    |

**End of Test Report**