

## FCC MPE Report

Applicant : ADLINK TECHNOLOGY INC.  
Product Name : Arm-based IoT Gateway  
Trade Name : ADLINK  
Model Number : EMU-200-W, EMU-200L-W  
Applicable Standard : 47 CFR § 2.1091  
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### Issued by

Approved By : \_\_\_\_\_

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### Revision History

| Version | Issued Date   | Revisions     | Revised By  |
|---------|---------------|---------------|-------------|
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|         |               |               |             |
|         |               |               |             |
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## 1. General Information

### 1.1 Reference Applicable Standard

| Standard        | Description                                                                                                                                      | Version |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| IEEE C95.1      | American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York. | 1992    |
| 47 CFR § 2.1091 | Radiofrequency radiation exposure evaluation: mobile devices.                                                                                    | -       |
| 47 CFR § 1.1310 | Radiofrequency radiation exposure limits.                                                                                                        | -       |

### 1.2 Testing Location

Lab Name: Eurofins E&E Wireless Taiwan Co., Ltd.

Site Address: ☒ No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan (R.O.C.)

Site Address: ☐ No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)

## 2. Description of Equipment under Test (EUT)

|                              |                                                                                        |            |              |                          |               |          |
|------------------------------|----------------------------------------------------------------------------------------|------------|--------------|--------------------------|---------------|----------|
| Applicant                    | ADLINK TECHNOLOGY INC.<br>No 66 Huaya 1st Rd Guishan District Taoyuan City, 333 Taiwan |            |              |                          |               |          |
| Product Name                 | Arm-based IoT Gateway                                                                  |            |              |                          |               |          |
| Trade Name                   | ADLINK                                                                                 |            |              |                          |               |          |
| Model Number                 | EMU-200-W, EMU-200L-W                                                                  |            |              |                          |               |          |
| Models Different Description | Series                                                                                 |            |              | Description              |               |          |
|                              | EMU-200-W                                                                              |            |              | w/ Web Console; w/ WIFI  |               |          |
|                              | EMU-200L-W                                                                             |            |              | w/o Web Console; w/ WIFI |               |          |
| FCC ID                       | X4D-EMU-200                                                                            |            |              |                          |               |          |
| Use Distance                 | 20 cm                                                                                  |            |              |                          |               |          |
| Antenna Information          | Antenna                                                                                | Trade Name | Model No.    | Type                     | Gain          |          |
|                              | ANT-0                                                                                  | VSO        | JR2Q00498-X0 | Dipole Antenna           | 2.4 GHz       | 2.04 dBi |
|                              |                                                                                        |            |              |                          | 5150~5350 MHz | 2.14 dBi |
|                              |                                                                                        |            |              |                          | 5725~5850 MHz | 2.33 dBi |
|                              | ANT-1                                                                                  | VSO        | JR2Q00498-X0 | Dipole Antenna           | 2.4 GHz       | 1.74 dBi |
|                              |                                                                                        |            |              |                          | 5150~5350 MHz | 2.14 dBi |
|                              |                                                                                        |            |              |                          | 5725~5850 MHz | 2.33 dBi |

Note:

The above information of DUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 2.1 RF Specification

| Wi-Fi 2.4G         |                                             |                                             |                                             |                                             |
|--------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| Support type:      | <input checked="" type="checkbox"/> 802.11b | <input checked="" type="checkbox"/> 802.11g | <input checked="" type="checkbox"/> 802.11n | <input type="checkbox"/> 802.11ax           |
| Support bandwidth: | <input checked="" type="checkbox"/> 20 MHz  | <input checked="" type="checkbox"/> 40 MHz  |                                             |                                             |
| Wi-Fi 5G           |                                             |                                             |                                             |                                             |
| Operation Band:    | <input checked="" type="checkbox"/> U-NII-1 | <input type="checkbox"/> U-NII-2A           | <input type="checkbox"/> U-NII-2C           | <input checked="" type="checkbox"/> U-NII-3 |
|                    | <input type="checkbox"/> U-NII-5            |                                             |                                             |                                             |
| Support type:      | <input checked="" type="checkbox"/> 802.11a | <input checked="" type="checkbox"/> 802.11n | <input type="checkbox"/> 802.11ac           | <input type="checkbox"/> 802.11ax           |
| Support bandwidth: | <input checked="" type="checkbox"/> 20 MHz  | <input checked="" type="checkbox"/> 40 MHz  | <input type="checkbox"/> 80 MHz             | <input type="checkbox"/> 160 MHz            |

### 3. RF Exposure Limit

For devices that operate at larger distances from persons, where there are minimal RF coupling interactions between a device and the user or nearby persons, RF exposure compliance using maximum permissible exposure (MPE) limits is applied. The limits for MPE is listed as below:

| 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 Time 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 <sup>2</sup> )*                | 30                                                              |
| 30-300                                                | 27.5                              | 0.073                             | 0.2                                     | 30                                                              |
| 300-1500                                              | -                                 | -                                 | F / 1,500                               | 30                                                              |
| 1,500-100,000                                         | -                                 | -                                 | 1.0                                     | 30                                                              |
| 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 Time E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
| 0.3-3.0                                               | 614                               | 1.63                              | (100)*                                  | 6                                                               |
| 3.0-30                                                | 1,842 / f                         | 4.89 / f                          | (900 / f <sup>2</sup> )*                | 6                                                               |
| 30-300                                                | 61.4                              | 0.163                             | 1.0                                     | 6                                                               |
| 300-1,500                                             | -                                 | -                                 | F / 300                                 | 6                                                               |
| 1,500-100,000                                         | -                                 | -                                 | 5                                       | 6                                                               |

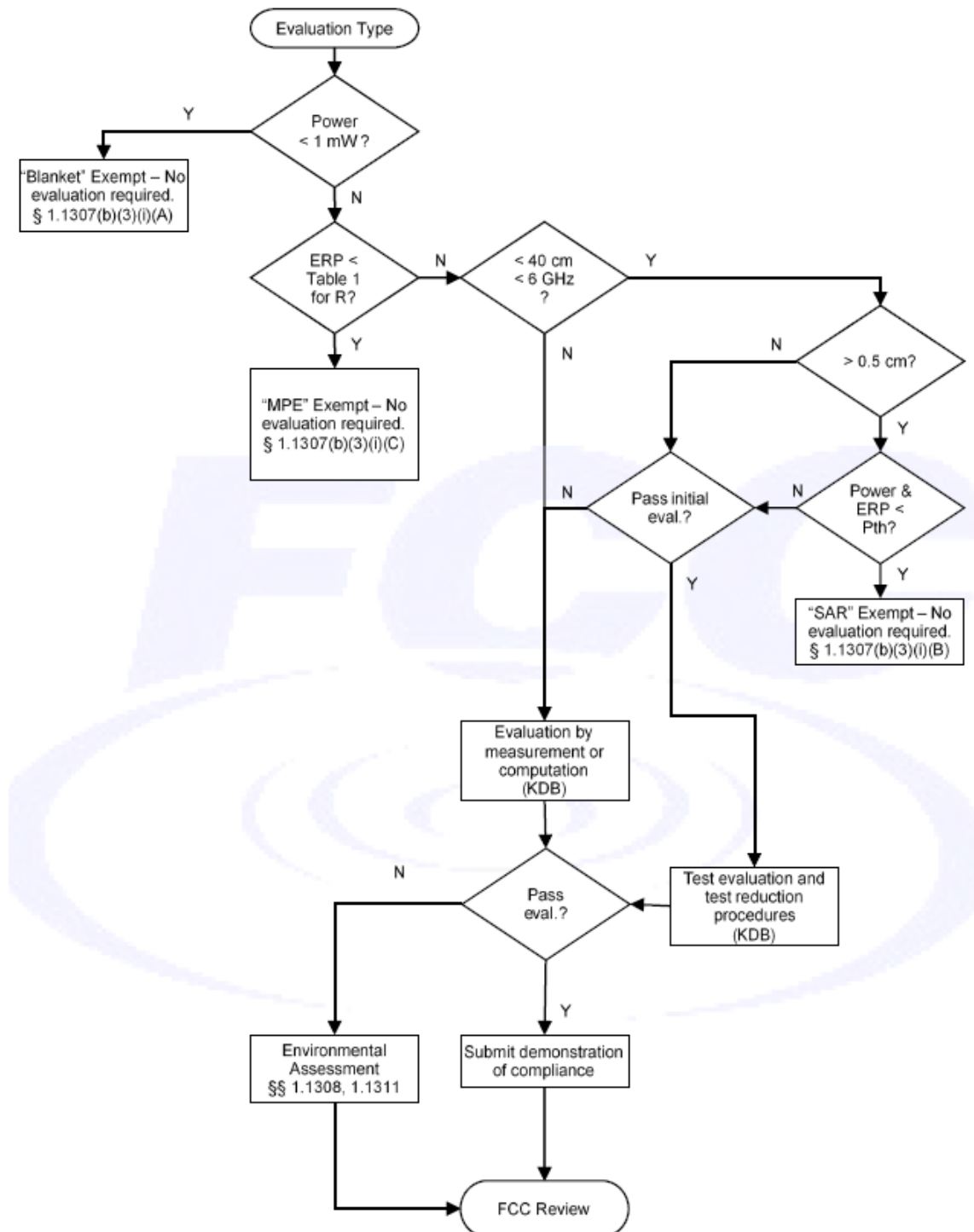
f = frequency in MHz. \* = Plane-wave equivalent power density.

## 4. RF Exposure Assessment

### 4.1 Exemption Evaluation

Exemption evaluation was performed according to the appendix A and B in KDB447498 D04.

The General Sequence for Determination of Procedure demonstrated in Figure A.1 of KDB447498 D04 was applied.



## 4.2 Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons."

Exposure evaluation

$$S_{eirp} = \frac{EIRP}{4\pi d^2} = \frac{PG}{4\pi d^2} (W / m^2)$$

Where

S: is the input power (W);

G: is the antenna gain;

d : is the distance between antennas and evaluation point (m).



## 5. Maximum Transmitting Mode Evaluation

| Antenna transmission description                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------|
| WLAN 2.4 GHz : 1TX (Diversity) / 2TX (MIMO)<br>WLAN 5.2 GHz : 1TX (Diversity) / 2TX Diversity)<br>WLAN 5.8 GHz : 1TX (Diversity) / 2TX (Diversity) |

## 6. Result

| Band         | Frequency (MHz) | Conducted Power (dBm) [P] | ANT Gain (dBi) | Numeric Gain [G] | Power with Duty cycle (mW) [P]x[G] | Power Density (mW/cm <sup>2</sup> ) [S] | Standalone Limit (mW/cm <sup>2</sup> ) |
|--------------|-----------------|---------------------------|----------------|------------------|------------------------------------|-----------------------------------------|----------------------------------------|
| WLAN 2.4 GHz | 2412 - 2472     | 17.41                     | 2.04           | 1.60             | 88.13                              | 0.02                                    | 1.00                                   |
| WLAN 5.2 GHz | 5150 - 5250     | 15.81                     | 2.14           | 1.64             | 62.49                              | 0.01                                    | 1.00                                   |
| WLAN 5.8 GHz | 5725 - 5850     | 12.34                     | 2.33           | 1.71             | 29.31                              | 0.01                                    | 1.00                                   |

Note:

1. Mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less.
2. The maximum power and gain were applied to evaluate MPE.
3. The device operating IEEE 802.11 n mode is 2TX MIMO for WLAN2.4G.

**MAX MPE:** 0.02 mW/cm<sup>2</sup>

**Simultaneous Transmitting :**

WLAN 2.4 GHz + WLAN 5 GHz

**TER:** 0.03

## 7. Conclusion

The result shows that this device is compliance with the exposure limits in 47 CFR §1.1310.

---END---