

# RF EXPOSURE REPORT

|           |                                                                                             |
|-----------|---------------------------------------------------------------------------------------------|
| Applicant | Lenovo (Shanghai) Electronics Technology Co., Ltd.                                          |
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|                                     |                                                                                     |
|-------------------------------------|-------------------------------------------------------------------------------------|
| Manufacturer or Supplier            | Lenovo PC HK Limited                                                                |
| Address                             | 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, P.R.China |
| Product                             | Lenovo Smart Frame                                                                  |
| Brand Name                          | Lenovo                                                                              |
| Model                               | Lenovo CD-3L501F                                                                    |
| Additional Model & Model Difference | N/A                                                                                 |
| Date of tests                       | Apr. 07, 2020 ~ Apr. 27, 2020                                                       |

- ☒ FCC Part 2 (Section 2.1091)
- ☒ KDB 447498 D01
- ☒ IEEE C95.1

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

|                                                                                     |                                                                                                                 |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Tested by Andy Zhu<br>Project Engineer / EMC Department                             | Approved by Glyn He<br>Assistant Manager / EMC Department                                                       |
|  | <br><br>Date: May 13, 2020 |

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Test Report No.: FM200407N032

## RELEASE CONTROL RECORD

| ISSUE NO.    | REASON FOR CHANGE | DATE ISSUED  |
|--------------|-------------------|--------------|
| FM200407N032 | Original release  | May 13, 2020 |



Test Report No.: FM200407N032

## 1. CERTIFICATION

**PRODUCT:** Lenovo Smart Frame

**BRAND NAME:** Lenovo

**MODEL NO.:** Lenovo CD-3L501F

**ADDITIONAL MODEL:** N/A

**FCC ID:** O57CD3L501F

**TEST SAMPLE:** ENGINEERING SAMPLE

**APPLICANT:** Lenovo (Shanghai) Electronics Technology Co., Ltd.

**TESTED DATES:** Apr. 07, 2020 ~ Apr. 27, 2020

**STANDARDS:** FCC Part 2 (Section 2.1091)  
KDB 447498 D01  
IEEE C95.1

## 2. RF EXPOSURE LIMIT

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| FREQUENCY RANGE (MHz)                                 | ELECTRIC FIELD STRENGTH (V/m) | MAGNETIC FIELD STRENGTH (A/m) | POWER DENSITY (mW/cm <sup>2</sup> ) | AVERAGE TIME (minutes) |
|-------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE |                               |                               |                                     |                        |
| 300-1500                                              | ...                           | ...                           | F/1500                              | 30                     |
| 1500-100,000                                          | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

## 3. MPE CALCULATION FORMULA

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

## 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

| Frequency Band               | Antenna Gain (dBi) | Antenna Type |
|------------------------------|--------------------|--------------|
| BT 2.4GHz                    | 4.86               | PIFA Antenna |
| Wi-Fi 2.4GHz                 | 3.84               | PIFA Antenna |
| Wi-Fi 5GHz<br>(5150-5250MHz) | 4.94               | PIFA Antenna |
| Wi-Fi 5GHz<br>(5250-5350MHz) | 4.94               | PIFA Antenna |
| Wi-Fi 5GHz<br>(5500-5725MHz) | 4.94               | PIFA Antenna |
| Wi-Fi 5GHz<br>(5725-5850MHz) | 4.94               | PIFA Antenna |

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

The tuned conducted Average Power (declared by client)

| Mode              | Frequency (MHz) | Target Power (dBm) | Tolerance (dBm) | Lower Tolerance (dBm) | Upper Tolerance (dBm) |
|-------------------|-----------------|--------------------|-----------------|-----------------------|-----------------------|
| BT (GFSK)         | 2402-2480MHz    | 4                  | +2              | 2                     | 6                     |
| BT (8DPSK)        | 2402-2480MHz    | 4                  | +2              | 2                     | 6                     |
| BT-LE (GFSK)      | 2402-2480MHz    | 4                  | +2              | 2                     | 6                     |
| 802.11b           | 2412-2462MHz    | 13                 | +2              | 11                    | 15                    |
| 802.11g           | 2412-2462MHz    | 15                 | +2              | 13                    | 17                    |
| 802.11n HT20      | 2412-2462MHz    | 15                 | +2              | 13                    | 17                    |
| 802.11n HT40      | 2422-2452MHz    | 14                 | +2              | 12                    | 16                    |
| Wi-Fi 5GHz(Band1) | 5150-5250MHz    | 14                 | +2              | 12                    | 16                    |
| Wi-Fi 5GHz(Band2) | 5250-5350MHz    | 13                 | +2              | 11                    | 15                    |
| Wi-Fi 5GHz(Band3) | 5500-5725MHz    | 13                 | +2              | 11                    | 15                    |
| Wi-Fi 5GHz(Band4) | 5725-5850MHz    | 13                 | +2              | 11                    | 15                    |

The measured conducted Average Power

| Mode              | Frequency (MHz) | Averaged Power (dBm) |
|-------------------|-----------------|----------------------|
| BT (GFSK)         | 2441            | 4.85                 |
| BT (8DPSK)        | 2441            | 4.88                 |
| BT-LE (GFSK)      | 2480            | 4.29                 |
| 802.11b           | 2462            | 13.74                |
| 802.11g           | 2462            | 15.68                |
| 802.11n HT20      | 2412            | 15.88                |
| 802.11n HT40      | 2452            | 14.39                |
| Wi-Fi 5GHz(Band1) | 5190            | 14.40                |
| Wi-Fi 5GHz(Band2) | 5290            | 13.42                |
| Wi-Fi 5GHz(Band3) | 5610            | 13.42                |
| Wi-Fi 5GHz(Band4) | 5785            | 13.57                |

| FREQUENCY BAND (MHz) | MAX AVERAGE POWER (dBm) | ANTENNA GAIN (dBi) | DISTANCE (cm) | POWER DENSITY (mW/cm <sup>2</sup> ) | LIMIT (mW/cm <sup>2</sup> ) |
|----------------------|-------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| BT                   | 6                       | 4.86               | 20            | 0.003849                            | 1.0                         |
| Wi-Fi 2.4GHz         | 17                      | 3.84               | 20            | 0.038288                            | 1.0                         |
| Wi-Fi 5GHz           | 16                      | 4.94               | 20            | 0.039125                            | 1.0                         |

## CONCLUSION:

The BT and Wi-Fi can transmit simultaneously, but Wi-Fi 2.4G and Wi-Fi 5G can not transmit simultaneously, the formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

**CPD = Calculation power density**

**LPD = Limit of power density**

$$(0.003849/1) + (0.039125 / 1) = 0.042974 < 1, \text{ which is less than the "1" limit.}$$

--- END ---