

# Maximum Permissible Exposure Evaluation

## FCC ID: A5MCAMERAR1

### 1. Client Information

|                     |   |                                                                                                      |
|---------------------|---|------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>    | : | Lenovo (Beijing) Limited                                                                             |
| <b>Address</b>      | : | No.6, Chuang Ye Road Shangdi Information Industry Base, Haidian District, Beijing 100085, P.R. China |
| <b>Manufacturer</b> | : | Lenovo (Beijing) Limited                                                                             |
| <b>Address</b>      | : | No.6, Chuang Ye Road Shangdi Information Industry Base, Haidian District, Beijing 100085, P.R. China |

### 2. General Description of EUT

|                               |   |                                                                                                                     |
|-------------------------------|---|---------------------------------------------------------------------------------------------------------------------|
| <b>EUT Name</b>               | : | Lenovo Smart Camera                                                                                                 |
| <b>Models No.</b>             | : | R1                                                                                                                  |
| <b>Model Difference</b>       | : | N/A                                                                                                                 |
| <b>Product Description</b>    | : | Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz~2452MHz                           |
|                               | : | Number of Channel: 802.11b/g/n(HT20):11 channels<br>802.11n(HT40): 7 channels                                       |
|                               | : | RF Output Power: 802.11b: 16.15 dBm<br>802.11g: 14.90 dBm<br>802.11n (HT20): 13.75 dBm<br>802.11n (HT40): 12.20 dBm |
|                               | : | Antenna Gain: 2 dBi PIFA Antenna                                                                                    |
|                               | : | Modulation Type: 802.11b: CCK, QPSK, BPSK<br>802.11g/n: OFDM                                                        |
|                               | : | Bit Rate of Transmitter: 802.11b:11/5.5/2/1Mbps<br>802.11g:54/48/36/24/18/12/9/6 Mbps<br>802.11n: up to 135Mbps     |
|                               | : |                                                                                                                     |
| <b>Power Supply</b>           | : | USB DC 5V from AC/DC Adapter(A18A-050100U-US2):<br>Input: AC 100-240V, 50/60Hz, Max 0.2A.<br>Output: DC 5V, 1A.     |
| <b>Software Version</b>       | : | N/A                                                                                                                 |
| <b>Hardware Version</b>       | : | N/A                                                                                                                 |
| <b>Connecting I/O Port(S)</b> | : | Please refer to the User's Manual                                                                                   |

#### Note:

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



## MPE Calculations for WiFi

### 1. Antenna Gain:

PIFA Antenna: 2Bi.

### 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] |
| 802.11b                  | 1               | 2412        | 15.72                      | 16±1               | 17                          | 2                  | 20                | 0.0158                                   |
|                          |                 | 2437        | 16.15                      | 16±1               | 17                          | 2                  | 20                | 0.0158                                   |
|                          |                 | 2462        | 15.89                      | 16±1               | 17                          | 2                  | 20                | 0.0158                                   |
| 802.11g                  | 1               | 2412        | 14.19                      | 14±1               | 15                          | 2                  | 20                | 0.0100                                   |
|                          |                 | 2437        | 14.90                      | 14±1               | 15                          | 2                  | 20                | 0.0100                                   |
|                          |                 | 2462        | 14.88                      | 14±1               | 15                          | 2                  | 20                | 0.0100                                   |
| 802.11n (HT20)           | 1               | 2412        | 13.34                      | 13±1               | 14                          | 2                  | 20                | 0.0079                                   |
|                          |                 | 2437        | 13.75                      | 13±1               | 14                          | 2                  | 20                | 0.0079                                   |
|                          |                 | 2462        | 13.11                      | 13±1               | 14                          | 2                  | 20                | 0.0079                                   |
| 802.11n (HT40)           | 1               | 2422        | 11.97                      | 12±1               | 13                          | 2                  | 20                | 0.0063                                   |
|                          |                 | 2437        | 12.20                      | 12±1               | 13                          | 2                  | 20                | 0.0063                                   |
|                          |                 | 2452        | 12.18                      | 12±1               | 13                          | 2                  | 20                | 0.0063                                   |

Note:

(1) N<sub>TX</sub>= 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 802.11b/g/n (2412~2462 MHz)

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

The MPE is calculated as **0.0158mW / cm<sup>2</sup>** < limit 1 mW / cm<sup>2</sup>. 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.

**Note**

For a more detailed features description, please refer to the RF Test Report.

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