

# Maximum Permissible Exposure Evaluation

## FCC ID: 2ANQZ-AK8639

### 1. Client Information

**Applicant** : Shenzhen Micro Star Electronic Technology Co.,Ltd.  
**Address** : 4F, Block C, NO. 56, FengTang Road, Fuyong, Bao'an district, Shenzhen, P.R.C.  
**Manufacturer** : Shenzhen Micro Star Electronic Technology Co.,Ltd.  
**Address** : 4F, Block C, NO. 56, FengTang Road, Fuyong, Bao'an district, Shenzhen, P.R.C.

### 2. General Description of EUT

|                               |                          |                                                                                                    |
|-------------------------------|--------------------------|----------------------------------------------------------------------------------------------------|
| <b>EUT Name</b>               | :                        | IP CAMERA                                                                                          |
| <b>Models No.</b>             | :                        | AK8639                                                                                             |
| <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):9 channels                                          |
|                               | RF Output Power:         | 802.11b: 17.75 dBm<br>802.11g: 16.97 dBm<br>802.11n (HT20): 16.33 dBm<br>802.11n (HT40): 16.86 dBm |
|                               | Antenna Gain:            | 3.26 dBi Integral Antenna                                                                          |
|                               | Modulation Type:         | 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>802.11g/n:OFDM(BPSK,QPSK,16QAM, 64QAM)                         |
|                               | Bit Rate of Transmitter: | 802.11b:11/5.5/2/1 Mbps<br>802.11g:54/48/36/24/18/12/9/6 Mbps<br>802.11n:up to 150Mbps             |
| <b>Power Rating</b>           | :                        | DC 5V by USB Cable                                                                                 |
| <b>Connecting I/O Port(S)</b> | :                        | Please refer to the User's Manual                                                                  |

TB-RF-075-1.0

## MPE Calculations for WiFi

### 1. Antenna Gain:

Integral Antenna: 3.26dBi.

### 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        | 17.75                      | 17±1               | 18                          | 3.26               | 20                | 0.0266                                   |
|                          |                 | 2437        | 17.65                      | 17±1               | 18                          | 3.26               | 20                | 0.0266                                   |
|                          |                 | 2462        | 17.29                      | 17±1               | 18                          | 3.26               | 20                | 0.0266                                   |
| 802.11g                  | 1               | 2412        | 16.14                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2437        | 16.79                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2462        | 16.97                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
| 802.11n (HT20)           | 1               | 2412        | 16.20                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2437        | 16.33                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2462        | 16.23                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
| 802.11n (HT40)           | 1               | 2422        | 16.73                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2437        | 16.70                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |
|                          |                 | 2452        | 16.86                      | 16±1               | 17                          | 3.26               | 20                | 0.0211                                   |

**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  $0.0266 \text{ mW} / \text{cm}^2 < \text{limit } 1 \text{ mW} / \text{cm}^2$ . 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-----