

## RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

FCC ID: [2ABO5-CB53](#)

### EUT Specification

|                                   |                                                                                                                                                                                                                                                  |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT</b>                        | <b>1080P OUTDOOR WIFI IP CAMERA</b>                                                                                                                                                                                                              |
| <b>Frequency band (Operating)</b> | <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz<br><input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz<br><input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz<br><input type="checkbox"/> Others: BLE: 2402-2480MHz |
| <b>Device category</b>            | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)<br><input type="checkbox"/> Others ____                                                                                    |
| <b>Exposure classification</b>    | <input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )                                                    |
| <b>Antenna diversity</b>          | <input checked="" type="checkbox"/> Single antenna<br><input type="checkbox"/> Multiple antennas<br><input type="checkbox"/> Tx diversity<br><input type="checkbox"/> Rx diversity<br><input type="checkbox"/> Tx/Rx diversity                   |
| <b>Max. output power</b>          | 21.90 dBm (0.1549W)                                                                                                                                                                                                                              |
| <b>Antenna gain (Max)</b>         | 4 dBi                                                                                                                                                                                                                                            |
| <b>Evaluation applied</b>         | <input checked="" type="checkbox"/> MPE Evaluation<br><input type="checkbox"/> SAR Evaluation                                                                                                                                                    |

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 |
|--------------------------------------------------------------|------------------------------|------------------------------|------------------------------------|--------------|
| <b>(A) Limits for Occupational/Control Exposures</b>         |                              |                              |                                    |              |
| <b>300-1500</b>                                              | --                           | --                           | <b>F/300</b>                       | <b>6</b>     |
| <b>1500-100000</b>                                           | --                           | --                           | <b>5</b>                           | <b>6</b>     |
| <b>(B) Limits for General Population/Uncontrol Exposures</b> |                              |                              |                                    |              |
| <b>300-1500</b>                                              | --                           | --                           | <b>F/1500</b>                      | <b>6</b>     |
| <b>1500-100000</b>                                           | --                           | --                           | <b>1</b>                           | <b>30</b>    |

## Friis transmission formula: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

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

$P_d$  the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

| Operating Mode | Channel Frequency (MHz) | Maximum output power (dBm) | Tune up tolerance (dBm) | Max. Tune up Power (dBm) | Antenna Gain (dBi) | Power density at 20cm (mW/ cm <sup>2</sup> ) | Power density Limits (mW/cm <sup>2</sup> ) |
|----------------|-------------------------|----------------------------|-------------------------|--------------------------|--------------------|----------------------------------------------|--------------------------------------------|
| 802.11b        | 2412                    | 19.40                      | 19.40 ± 1               | 20.40                    | 4                  | 0.0548                                       | 1                                          |
|                | 2437                    | 17.94                      | 17.94 ± 1               | 18.94                    | 4                  | 0.0392                                       | 1                                          |
|                | 2462                    | 19.70                      | 19.70 ± 1               | 20.70                    | 4                  | 0.0587                                       | 1                                          |
| 802.11g        | 2412                    | 21.89                      | 21.89 ± 1               | 22.89                    | 4                  | 0.0973                                       | 1                                          |
|                | 2437                    | 20.63                      | 20.63 ± 1               | 21.63                    | 4                  | 0.0728                                       | 1                                          |
|                | 2462                    | 21.90                      | 21.90 ± 1               | 22.90                    | 4                  | 0.0975                                       | 1                                          |
| 802.11n (HT20) | 2412                    | 21.00                      | 21.00 ± 1               | 22.00                    | 4                  | 0.0792                                       | 1                                          |
|                | 2437                    | 20.19                      | 20.19 ± 1               | 21.19                    | 4                  | 0.0658                                       | 1                                          |
|                | 2462                    | 21.45                      | 21.45 ± 1               | 22.45                    | 4                  | 0.0879                                       | 1                                          |