

## 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: Z63-FWIP2-I

### EUT Specification

|                                       |   |
|---------------------------------------|---|
| <b>EUT</b>                            | Indoor Wi-Fi IP Plug In 1080p Deterrence Camera with 2-Way Audio – White  |
| <b>Model Number</b>                   | WCM-FWIP2-I   |
| <b>Rating</b>                         | DC 5V 1000mA  |
| <b>Frequency band (Operating)</b>     | <input type="checkbox"/> BT: 2.402GHz ~ 2.480GHz<br><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 ~ 5.825GHz |
| <b>Device category</b>                | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)   |
| <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 (peak power)</b> | IEEE 802.11b: 11.16 dBm<br>IEEE 802.11g: 11.14 dBm<br>IEEE 802.11n-HT20: 11.14 dBm<br>IEEE 802.11n-HT40: 11.13 dBm  |
| <b>Antenna gain (Max)</b>             | 2.4GHz WIFI: 2.29dBi  |
| <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>         |                              |                              |                                    |              |
| 300-1500   | --                           | --                           | F/300                              | 6            |
| 1500-100000  | --                           | --                           | 5                                  | 6            |
| <b>(B) Limits for General Population/Uncontrol Exposures</b> |                              |                              |                                    |              |
| 300-1500   | --                           | --                           | F/1500                             | 6            |

|             |    |    |   |    |
|-------------|----|----|---|----|
| 1500-100000 | -- | -- | 1 | 30 |
|-------------|----|----|---|----|

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

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 = 20cm

$P_d$  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**

## 2.4GHz WIFI:

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Level (dBm) | Limit (dBm) | Verdict |
|----------------|----------------|-------------------------|-------------------------|-------------|---------|
| 802.11b        | 1              | 2412                    | 11.16                   | 30          | PASS    |
|                | 6              | 2437                    | 11.14                   | 30          | PASS    |
|                | 11             | 2462                    | 11.13                   | 30          | PASS    |
| 802.11g        | 1              | 2412                    | 11.14                   | 30          | PASS    |
|                | 6              | 2437                    | 11.13                   | 30          | PASS    |
|                | 11             | 2462                    | 11.12                   | 30          | PASS    |
| 802.11n (HT20) | 1              | 2412                    | 11.13                   | 30          | PASS    |
|                | 6              | 2437                    | 11.13                   | 30          | PASS    |
|                | 11             | 2462                    | 11.14                   | 30          | PASS    |
| 802.11n (HT40) | 3              | 2422                    | 11.12                   | 30          | PASS    |
|                | 6              | 2437                    | 11.13                   | 30          | PASS    |
|                | 9              | 2452                    | 11.13                   | 30          | PASS    |

| Operating Mode | Test Channel | Tune up tolerance (dBm) | Max tune up conducted power(dBm) | Output Peak power (mW) | Ant. Gain (dBi) | Ant. Gain (numeric) | Power density at 20cm (mW/ cm2) | Power density Limits (mW/ cm2) |
|----------------|--------------|-------------------------|----------------------------------|------------------------|-----------------|---------------------|---------------------------------|--------------------------------|
| 802.11b        | 1            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 6            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 11           | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
| 802.11g        | 1            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 6            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 11           | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
| 802.11n (HT20) | 1            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 6            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 11           | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
| 802.11n (HT40) | 3            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 6            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |
|                | 9            | 11 ± 1                  | 12                               | 15.849                 | 2.29            | 1.694               | 0.005342                        | 1                              |

The Product unsupported at the same time to Transmitting. According to KDB 447498, and no simultaneous SAR measurement is required.

Signature:



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