

## 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: 2AKWJ-FVRF3602

### EUT Specification

|                                   |                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT</b>                        | WiFi Smart Camera                                                                                                                                                                                                              |
| <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  |
| <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>          | 14.51dBm(0.0282W)                                                                                                                                                                                                              |
| <b>Antenna gain (Max)</b>         | 3 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>         |                              |                              |                                    |              |
| 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

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

| Modulation   | Maximum Peak Output Power (dBm) |                |              |
|--------------|---------------------------------|----------------|--------------|
|              | Low Channel                     | Middle Channel | High Channel |
| 802.11b      | 14.49                           | 14.18          | 14.51        |
| 802.11g      | 13.99                           | 14.05          | 13.44        |
| 802.11n-HT20 | 13.58                           | 13.29          | 13.33        |
| 802.11n-HT40 | 14.17                           | 14.11          | 12.25        |

| 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/cm <sup>2</sup> ) | Power density Limits (mW/cm <sup>2</sup> ) |
|----------------|--------------|-------------------------|-----------------------------------|------------------------|-----------------|---------------------|---------------------------------------------|--------------------------------------------|
| 802.11b        | 1            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 6            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 11           | 15 ± 1                  | 16                                | 39.81                  | 3               | 1.995               | 0.015803                                    | 1                                          |
| 802.11g        | 1            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 6            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 11           | 13 ± 1                  | 14                                | 25.12                  | 3               | 1.995               | 0.009971                                    | 1                                          |
| 802.11n-H T20  | 1            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 6            | 13 ± 1                  | 14                                | 25.12                  | 3               | 1.995               | 0.009971                                    | 1                                          |
|                | 11           | 13 ± 1                  | 14                                | 25.12                  | 3               | 1.995               | 0.009971                                    | 1                                          |
| 802.11n-H T40  | 3            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 6            | 14 ± 1                  | 15                                | 31.62                  | 3               | 1.995               | 0.012552                                    | 1                                          |
|                | 9            | 12 ± 1                  | 13                                | 19.95                  | 3               | 1.995               | 0.007920                                    | 1                                          |

Signature



Date: 2017-12-08