

## 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:WUI-BT530024

### EUT Specification

|                                   |                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT</b>                        | Dash Cam 2.4G Module                                                                                                                                                                                                           |
| <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>          | 802.11b: 15.29dBm<br>802.11g: 15.05dBm<br>802.11n(HT20): 14.94dBm<br>802.11n(HT40): 14.07dBm                                                                                                                                   |
| <b>Antenna gain (Max)</b>         | 6dBi                                                                                                                                                                                                                           |
| <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: $P_d = \frac{P_{out} \cdot G}{4 \cdot \pi \cdot R^2}$

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

$P_d$  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

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Level (dBm) | Limit (dBm) | Verdict |
|----------------|----------------|-------------------------|-------------------------|-------------|---------|
|                |                |                         | Ant1                    |             |         |
| 802.11b        | 1              | 2412                    | 14.90                   | 30          | PASS    |
|                | 6              | 2437                    | 14.84                   | 30          | PASS    |
|                | 11             | 2462                    | 15.29                   | 30          | PASS    |
| 802.11g        | 1              | 2412                    | 14.14                   | 30          | PASS    |
|                | 6              | 2437                    | 14.58                   | 30          | PASS    |
|                | 11             | 2462                    | 15.05                   | 30          | PASS    |
| 802.11n (HT20) | 1              | 2412                    | 13.95                   | 30          | PASS    |
|                | 6              | 2437                    | 14.41                   | 30          | PASS    |
|                | 11             | 2462                    | 14.94                   | 30          | PASS    |
| 802.11n (HT40) | 3              | 2422                    | 13.52                   | 30          | PASS    |
|                | 6              | 2437                    | 13.79                   | 30          | PASS    |
|                | 9              | 2452                    | 14.07                   | 30          | PASS    |

Antenna 1

| 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            | $15 \pm 1$              | 16                               | 39.811                 | 6               | 3.981               | 0.031530                         | 1                               |
|                | 6            | $15 \pm 1$              | 16                               | 39.811                 | 6               | 3.981               | 0.031530                         | 1                               |
|                | 11           | $15 \pm 1$              | 16                               | 39.811                 | 6               | 3.981               | 0.031530                         | 1                               |
| 802.11g        | 1            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |
|                | 6            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |
|                | 11           | $15 \pm 1$              | 16                               | 39.811                 | 6               | 3.981               | 0.031530                         | 1                               |
| 802.11n        | 1            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |
| (HT20)         | 6            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |
|                | 11           | $15 \pm 1$              | 16                               | 39.811                 | 6               | 3.981               | 0.031530                         | 1                               |
| 802.11n        | 3            | $13 \pm 1$              | 14                               | 25.119                 | 6               | 3.981               | 0.019894                         | 1                               |
| (HT40)         | 6            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |
|                | 9            | $14 \pm 1$              | 15                               | 31.623                 | 6               | 3.981               | 0.025045                         | 1                               |

Signature:



Print: Alan He

Title: Manager

Date: 2020-04-29