

## 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:2A2H2-IHRV6-V7

### EUT Specification

|                               |                                                                                                                                                                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT                           | AUTOVAC Halo                                                                                                                                                                                                                        |
| Frequency band<br>(Operating) | <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz<br><input type="checkbox"/> WLAN: 5.18GHz ~ 5.24GHz<br><input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz<br><input type="checkbox"/> Others: 2.402GHz~2.480GHz (BLE) |
| Device category               | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)<br><input type="checkbox"/> Others ____                                                                       |
| Exposure classification       | <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> )                                       |
| Antenna diversity             | <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      |
| Max. output power             | 22.46dBm (0.1762W)                                                                                                                                                                                                                  |
| Antenna gain (Max)            | 1 dBi                                                                                                                                                                                                                               |
| Evaluation applied            | <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 |
|-------------------------------------------------------|------------------------------|------------------------------|------------------------------------|--------------|
| (A) Limits for Occupational/Control Exposures         |                              |                              |                                    |              |
| 300-1500                                              | ---                          | ---                          | F/300                              | 6            |
| 1500-100000                                           | ---                          | ---                          | 5                                  | 6            |
| (B) Limits for General Population/Uncontrol Exposures |                              |                              |                                    |              |
| 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  $mW/cm^2$

$P_{out}$  = 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,  $1mW/cm^2$ . 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 :

| Operating Mode | Channel Frequency | Measured Power | Tune up tolerance | Max. Tune up Power | Antenna Gain | Power density at 20cm | Power density Limits ( $mW/cm^2$ ) |
|----------------|-------------------|----------------|-------------------|--------------------|--------------|-----------------------|------------------------------------|
|                | (MHz)             | (dBm)          | (dBm)             | (dBm)              | (dBi)        | ( $mW/cm^2$ )         |                                    |
| 802.11b        | 2412              | 19.03          | $19.03 \pm 1$     | 20.03              | 1            | 0.0252                | 1                                  |
|                | 2437              | 19.11          | $19.11 \pm 1$     | 20.11              | 1            | 0.0257                | 1                                  |
|                | 2462              | 19.33          | $19.33 \pm 1$     | 20.33              | 1            | 0.0270                | 1                                  |
| 802.11g        | 2412              | 19.20          | $19.20 \pm 1$     | 20.2               | 1            | 0.0262                | 1                                  |
|                | 2437              | 19.27          | $19.27 \pm 1$     | 20.27              | 1            | 0.0267                | 1                                  |
|                | 2462              | 21.64          | $21.64 \pm 1$     | 22.64              | 1            | 0.0460                | 1                                  |
| 802.11n (HT20) | 2412              | 19.31          | $19.31 \pm 1$     | 20.31              | 1            | 0.0269                | 1                                  |
|                | 2437              | 20.13          | $20.13 \pm 1$     | 21.13              | 1            | 0.0325                | 1                                  |
|                | 2462              | 22.46          | $22.46 \pm 1$     | 23.46              | 1            | 0.0556                | 1                                  |

PASS