



## KSIGN (Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park,  
Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, People's Republic of China  
Tel.: + (86)755-29852678 Fax: + (86)755-29852397 E-mail: info@gdkesign.cn Website: www.gdkesign.com

### Maximum Permissible Exposure Evaluation

FCC ID: 2AWH2-F6S

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)

#### EUT Specification

|                            |                                                                                                                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT                        | Robotic Vacuum Cleaner                                                                                                                                                                                                                             |
| Frequency band (Operating) | <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz/2.422GHz~2.452 GHz<br><input type="checkbox"/> WCDMA Band II, Band IV, Band V<br><input type="checkbox"/> LTE FDD Band 2, Band 4, Band 5, Band 12<br><input type="checkbox"/> Others |
| Device category            | <input type="checkbox"/> Portable (<20cm separation)<br><input type="checkbox"/> Mobile (>20cm separation)<br><input checked="" type="checkbox"/> Fixed (>20cm separation)<br><input type="checkbox"/> Others                                      |
| Exposure classification    | <input type="checkbox"/> Occupational/Controlled exposure (S=5mW/cm2)<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm2)                                                                                  |
| 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          | WIFI: 13.21dBm                                                                                                                                                                                                                                     |
| Antenna gain (Max)         | WIFI: 2.5dBi                                                                                                                                                                                                                                       |
| 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<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) | Max. Measured 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        | CH06                    | 13.21                     | 13.21±1                 | 14.21                    | 2.5                | 0.0093                                      | 1                                          |
| 802.11g        | CH06                    | 11.87                     | 11.87±1                 | 12.87                    | 2.5                | 0.0069                                      | 1                                          |
| 802.11n (HT20) | CH06                    | 9.80                      | 9.80±1                  | 10.80                    | 2.5                | 0.0043                                      | 1                                          |
| 802.11n (HT40) | CH09                    | 10.17                     | 10.17±1                 | 11.17                    | 2.5                | 0.0046                                      | 1                                          |

## Note

For a more detailed features description, please refer to the RF Test Report.

