

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 Client Information

### Client Information

|                          |                                                                                                                     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------|
| Applicant:               | Shenzhen Qiluoxiang Technology Co., Ltd.                                                                            |
| Address of applicant:    | Room 1811, Block A, Xintianxia Bairuida Building, Vanke City Community, Bantian Street, Longgang District, Shenzhen |
| Manufacturer:            | Shenzhen Qiluoxiang Technology Co., Ltd.                                                                            |
| Address of manufacturer: | Room 1811, Block A, Xintianxia Bairuida Building, Vanke City Community, Bantian Street, Longgang District, Shenzhen |

### General Description of EUT

|                      |                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------|
| Product Name:        | wireless carplay adapter                                                                          |
| Trade Name:          | /                                                                                                 |
| Model No.:           | WA01                                                                                              |
| Adding Model(s):     | WA02 WA03 WA04 WA05 WA06 WA07 WA08 WA09 WA10 WA11<br>WA12 WA13 WA14 WA15 WA16 WA17 WA18 WA19 WA20 |
| Rated Voltage:       | DC 5V                                                                                             |
| Power Adapter Model: | /                                                                                                 |
| Serial number:       | 283HDK2003                                                                                        |
| FCC ID:              | 2A4VAWA01                                                                                         |

### Technical Characteristics of EUT

|                       |                                    |
|-----------------------|------------------------------------|
| Support Standards:    | 802.11b, 802.11g, 802.11n          |
| Frequency Range:      | 2412-2462MHz for 802.11b/g/n(HT20) |
| RF Output Power:      | 17.46dBm (Conducted)               |
| Type of Modulation:   | DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM  |
| Quantity of Channels: | 11 for 802.11b/g/n(HT20)           |
| Channel Separation:   | 5MHz                               |
| Type of Antenna:      | Integral Antenna                   |
| Antenna Gain:         | 1dBi                               |

## 1.2 Standard Applicable

According to §1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

### (a) Limits for Occupational / Controlled Exposure

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                  | 6                                                                      |
| 3.0-30                | 1842/f                            | 4.89/f                            | (900/f)*                                | 6                                                                      |
| 30-300                | 61.4                              | 0.163                             | 1.0                                     | 6                                                                      |
| 300-1500              | /                                 | /                                 | F/300                                   | 6                                                                      |
| 1500-100000           | /                                 | /                                 | 5                                       | 6                                                                      |

### (b) Limits for General Population / Uncontrolled Exposure

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                  | 30                                                                     |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f)*                                | 30                                                                     |
| 30-300                | 27.5                              | 0.073                             | 0.2                                     | 30                                                                     |
| 300-1500              | /                                 | /                                 | F/1500                                  | 30                                                                     |
| 1500-100000           | /                                 | /                                 | 1                                       | 30                                                                     |

Note: f = frequency in MHz: \* = Plane-wave equivalent power density

## 1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

## 1.4 MPE Calculation Result

Maximum peak output power: 17.46 (dBm)

Maximum tune-up peak output power: 18 (dBm)

Prediction distance: >20(cm)

Prediction frequency: 2437 (MHz)

Antenna gain: 1 (dBi)

Directional gain: 1.26(numeric)

The worst case is power density at prediction frequency at 20cm: 0.01(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

$$0.01(\text{mw}/\text{cm}^2) < 1 (\text{mw}/\text{cm}^2)$$

So the transmitter complies with the RF exposure requirements and the SAR is not required.