



# RF Exposure Requirements

## 1.1 General Information

### Client Information

**Applicant** ..... : Guangzhou Chineng Trading Co., Ltd.  
**Address of applicant** ..... : Self written by 1502-04(A810), No. 246, 248, 250 Wushan Road, Tianhe District, Guangzhou  
**Manufacturer** ..... : ZHONGSHAN YIJIA ELECTRICAL APPLIANCE CO., LIMITED  
**Address of manufacturer** ..... : No.7 Kete Road North, Dacen Industrial Zone, Huangpu Town, Zhongshan City, Guangdong, China

### General Description of E.U.T

**FCC ID** ..... : 2BRDN-TX15KW  
**Product Name** ..... : Convection Heater  
**Model No.** ..... : TX-15KWWH, TX-15KWBK  
**Model Description** ..... : Two models are identical except outlook color. Therefore the full tests were performed on model TX-15KWWH.  
**Rated Voltage** ..... : 120V~, 60Hz, 1500W  
**Battery Capacity** ..... : ---  
**Power Adapter** ..... : ---

### Technical Characteristics of EUT

#### 2.4G WiFi

**Support Standards** ..... : 802.11b, 802.11g, 802.11n  
**Frequency Range** ..... : 2412-2462MHz for 802.11b/g/n(HT20)  
**RF Output Power** ..... : 17.35dBm (Conducted )  
**Modulation** ..... : 802.11b: DSSS(DBPSK/DQPSK/CCK)  
802.11g/n: OFDM (BPSK/QPSK/16QAM/64QAM)  
**Data Rate** ..... : 1Mbps for 802.11b; 54Mbps for 802.11g; MCS7 for 802.11n  
**Quantity of Channels** ..... : 11 for 802.11b/g/n(HT20)  
**Channel Separation** ..... : 5MHz  
**Type of Antenna** ..... : PCB Antenna  
**Antenna Gain** ..... : 2.54dBi (Declared by the manufacturer)



## BLE

|                            |                                          |
|----------------------------|------------------------------------------|
| Bluetooth Version .....    | : Bluetooth LE                           |
| Frequency Range .....      | : 2402-2480MHz                           |
| RF Output Power .....      | : 7.32dBm (Conducted)                    |
| Modulation .....           | : GFSK                                   |
| Data Rate .....            | : 1Mbps                                  |
| Quantity of Channels ..... | : 40                                     |
| Channel Separation.....    | : 2MHz                                   |
| Type of Antenna .....      | : PCB Antenna                            |
| Antenna Gain .....         | : 2.54dBi (Declared by the manufacturer) |

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## 2 Applicable Standard

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 equivalents power density

## 3 Calculation Method

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

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), R=20cm.



#### 4 MPE Calculation Result

| Frequency<br>(MHz)  | Antenna<br>Gain<br>(dBi) | Numeric<br>gain | Conducted<br>Power<br>(dBm) | Maximum Tune-up<br>output power |       | PD<br>(mW/cm2) | Limit<br>(mW/cm2) |
|---------------------|--------------------------|-----------------|-----------------------------|---------------------------------|-------|----------------|-------------------|
|                     |                          |                 |                             | (dBm)                           | (mW)  |                |                   |
| 2462<br>(2.4G WiFi) | 2.54                     | 1.79            | 17.35                       | 18.00                           | 63.10 | 0.02253        | 1.0               |
| 2402<br>(BLE)       | 2.54                     | 1.79            | 7.32                        | 8.00                            | 6.31  | 0.00225        | 1.0               |

Result: Pass

=====End of Report=====

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