



# Maximum Permissible Exposure Evaluation

**FCC ID: 2BCTE-TS-1**

## 1. Client Information

|                     |   |  |
|---------------------|---|--|
| <b>Applicant</b>    | : | Shenzhen Feichang Huapin Technology Co., Ltd.  |
| <b>Address</b>      | : | 11th Floor, Xingbaohe Building, Xianian, Gongmingshang Village, Guangming District, Shenzhen City, Guangdong Province, China |
| <b>Manufacturer</b> | : | Shenzhen Feichang Huapin Technology Co., Ltd.  |
| <b>Address</b>      | : | 11th Floor, Xingbaohe Building, Xianian, Gongmingshang Village, Guangming District, Shenzhen City, Guangdong Province, China |

## 2. General Description of EUT

|                            |   |  |                      |   |
|----------------------------|---|--|----------------------|---|
| <b>EUT Name</b>            | :   | projector  |                      |   |
| <b>Models No.</b>          | :   | TS-1, T-1, T-2, T-3, T-4, T-5, T-6, T-7, T-8, T-9, TZ-1, TZ-2, TZ-3, TZ-4, TZ-5, TZ-6, TZ-7, TZ-8, TZ-9, TS-2, TS-3, TS-4, TS-5, TS-6, TS-7, TS-8, TS-9  |                      |   |
| <b>Model Different</b>     | :   | All PCB boards and circuit diagrams are the same, the only difference is that appearance.  |                      |   |
| <b>Sample ID</b>           | :   | 202308-0329-1-1# & 202308-0329-1-2#  |                      |   |
| <b>Product Description</b> | :   | <table border="0"> <tr> <td>Operation Frequency:</td> <td>U-NII-1: 5180MHz~5240MHz<br/>U-NII-3: 5745MHz~5825MHz<br/>802.11b/g/n(HT20): 2412MHz~2462MHz<br/>802.11n(HT40): 2422MHz-2452MHz<br/>Bluetooth 5.2(BR+EDR): 2402MHz~2480MHz<br/>Bluetooth 5.2(BLE): 2402MHz~2480MHz</td> </tr> </table> | Operation Frequency: | U-NII-1: 5180MHz~5240MHz<br>U-NII-3: 5745MHz~5825MHz<br>802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz-2452MHz<br>Bluetooth 5.2(BR+EDR): 2402MHz~2480MHz<br>Bluetooth 5.2(BLE): 2402MHz~2480MHz |
| Operation Frequency:       | U-NII-1: 5180MHz~5240MHz<br>U-NII-3: 5745MHz~5825MHz<br>802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz-2452MHz<br>Bluetooth 5.2(BR+EDR): 2402MHz~2480MHz<br>Bluetooth 5.2(BLE): 2402MHz~2480MHz |  |                      |   |
| <b>Power Rating</b>        | :   | Adapter (Model: RSF-DY113B-2202180US)<br>Input: 100-240V~ 50/60Hz, 1.5A<br>Output: 22V=2.2A  |                      |   |
| <b>Software Version</b>    | :   | ----   |                      |   |
| <b>Hardware Version</b>    | :   | FCHP-X4352-V1.0  |                      |   |
| <b>Remark</b>              | :   | The antenna gain provided by the applicant, the verified for the RF conduction test and adapter provided by TOBY test lab.   |                      |   |



## Method of Measurement for FCC

### 1. Max. Antenna Gain:

| Bluetooth            |       |            |      |                    |
|----------------------|-------|------------|------|--------------------|
| Antenna              | Brand | Model Name | Type | Antenna Gain (dBi) |
| ANT. 1               | N/A   | N/A        | PCB  | 1.73               |
| 2.4G WIFI            |       |            |      |                    |
| Antenna              | Brand | Model Name | Type | Antenna Gain (dBi) |
| ANT. 1               | N/A   | N/A        | PCB  | 1.73               |
| U-NII-1 5180~5240MHz |       |            |      |                    |
| Antenna              | Brand | Model Name | Type | Antenna Gain(dBi)  |
| ANT. 1               | N/A   | N/A        | PCB  | 5.25               |
| U-NII-3 5745~5825MHz |       |            |      |                    |
| Antenna              | Brand | Model Name | Type | Antenna Gain(dBi)  |
| ANT. 1               | N/A   | N/A        | PCB  | 5.25               |

### 2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

**S:** power density

**P:** power input to the antenna

**G:** power gain of the antenna in the direction of interest relative to an isotropic radiator.

**R:** distance to the center of radiation of the antenna

### Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is  $\leq 1.0$ .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$





#### 4. Test Result:

| Bluetooth MPE Result |                 |             |                            |                    |                             |                    |                   |  |
|----------------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|--|
| Mode                 | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ cm <sup>2</sup> ) [S] |
| GFSK                 | 1               | 2402        | 7.099                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2441        | 7.025                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2480        | 7.187                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
| π/4-DQPSK            | 1               | 2402        | 6.545                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2441        | 6.534                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2480        | 6.472                      | 6±1                | 7                           | 1.73               | 20                | 0.0015                                   |
| 8-DPSK               | 1               | 2402        | 6.775                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2441        | 7.013                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |
|                      |                 | 2480        | 7.013                      | 7±1                | 8                           | 1.73               | 20                | 0.0019                                   |

**Note:**

N<sub>TX</sub>= Number of Transmit Antennas  
RF Output power specifies that Maximum Conducted Peak Output Power.

| BLE MPE Result |                 |             |                            |                    |                             |                    |                   |  |
|----------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|--|
| Mode           | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ cm <sup>2</sup> ) [S] |
| BLE (1Mbps)    | 1               | 2402        | 4.819                      | 5±1                | 6                           | 1.73               | 20                | 0.0012                                   |
|                |                 | 2440        | 2.839                      | 3±1                | 4                           | 1.73               | 20                | 0.0007                                   |
|                |                 | 2480        | 2.748                      | 3±1                | 4                           | 1.73               | 20                | 0.0007                                   |
| BLE (2Mbps)    | 1               | 2402        | 5.054                      | 5±1                | 6                           | 1.73               | 20                | 0.0012                                   |
|                |                 | 2440        | 3.064                      | 3±1                | 4                           | 1.73               | 20                | 0.0007                                   |
|                |                 | 2480        | 3.25                       | 3±1                | 4                           | 1.73               | 20                | 0.0007                                   |

**Note:**

N<sub>TX</sub>= Number of Transmit Antennas  
RF Output power specifies that Maximum Conducted Peak Output Power.





| 2.4G WiFi MPE Result Antenna 1 |                 |             |                            |                    |                             |                    |                   |   |
|--------------------------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|---|
| Mode                           | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/cm <sup>2</sup> ) [S] |
| 802.11b                        | 1               | 2412        | 16.434                     | 16±1               | 17                          | 1.73               | 20                | 0.0149                                  |
|                                |                 | 2437        | 15.708                     | 16±1               | 17                          | 1.73               | 20                | 0.0149                                  |
|                                |                 | 2462        | 15.425                     | 15±1               | 16                          | 1.73               | 20                | 0.0118                                  |
| 802.11g                        | 1               | 2412        | 11.722                     | 12±1               | 13                          | 1.73               | 20                | 0.0059                                  |
|                                |                 | 2437        | 10.875                     | 11±1               | 12                          | 1.73               | 20                | 0.0047                                  |
|                                |                 | 2462        | 10.657                     | 11±1               | 12                          | 1.73               | 20                | 0.0047                                  |
| 802.11n20                      | 1               | 2412        | 12.007                     | 12±1               | 13                          | 1.73               | 20                | 0.0059                                  |
|                                |                 | 2437        | 11.2                       | 11±1               | 12                          | 1.73               | 20                | 0.0047                                  |
|                                |                 | 2462        | 10.89                      | 11±1               | 12                          | 1.73               | 20                | 0.0047                                  |
| 802.11n40                      | 1               | 2422        | 8.478                      | 8±1                | 9                           | 1.73               | 20                | 0.0024                                  |
|                                | 1               | 2437        | 8.027                      | 8±1                | 9                           | 1.73               | 20                | 0.0024                                  |
|                                | 1               | 2452        | 8.111                      | 8±1                | 9                           | 1.73               | 20                | 0.0024                                  |

**Note:**  
N<sub>TX</sub>= Number of Transmit Antennas  
RF Output power specifies that Maximum Conducted Peak Output Power.





| 5.2G WiFi MPE Result Antenna 1 |                 |             |                            |                    |                             |                    |                   |   |
|--------------------------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|---|
| Mode                           | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/cm <sup>2</sup> ) [S] |
| 802.11a                        | 1               | 5180        | 13.552                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5200        | 14.381                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5240        | 14.502                     | 15±1               | 16                          | 5.25               | 20                | 0.0265                                  |
| 802.11n20                      | 1               | 5180        | 13.507                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5200        | 13.895                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5240        | 14.759                     | 15±1               | 16                          | 5.25               | 20                | 0.0265                                  |
| 802.11n40                      | 1               | 5190        | 13.829                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5230        | 14.618                     | 15±1               | 16                          | 5.25               | 20                | 0.0265                                  |
| 802.11ac20                     | 1               | 5180        | 13.804                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5200        | 14.261                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5240        | 15.071                     | 15±1               | 16                          | 5.25               | 20                | 0.0265                                  |
| 802.11ac40                     | 1               | 5190        | 13.843                     | 14±1               | 15                          | 5.25               | 20                | 0.0211                                  |
|                                |                 | 5230        | 14.578                     | 15±1               | 16                          | 5.25               | 20                | 0.0265                                  |

**Note:**  
N<sub>TX</sub>= Number of Transmit Antennas  
RF Output power specifies that Maximum Conducted average Output Power.





| 5.8G WiFi MPE Result Antenna 1 |                 |             |                            |                    |                             |                    |                   |   |
|--------------------------------|-----------------|-------------|----------------------------|--------------------|-----------------------------|--------------------|-------------------|---|
| Mode                           | N <sub>TX</sub> | Freq. (MHz) | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/cm <sup>2</sup> ) [S] |
| 802.11a                        | 1               | 5745        | 11.660                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5785        | 10.981                     | 11±1               | 12                          | 5.25               | 20                | 0.0106                                  |
|                                |                 | 5825        | 11.518                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
| 802.11n20                      | 1               | 5745        | 11.783                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5785        | 11.832                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5825        | 11.803                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
| 802.11n40                      | 1               | 5755        | 11.846                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5795        | 11.133                     | 11±1               | 12                          | 5.25               | 20                | 0.0106                                  |
| 802.11ac20                     | 1               | 5745        | 11.783                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5785        | 11.295                     | 11±1               | 12                          | 5.25               | 20                | 0.0106                                  |
|                                |                 | 5825        | 11.738                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
| 802.11ac40                     | 1               | 5755        | 11.840                     | 12±1               | 13                          | 5.25               | 20                | 0.0133                                  |
|                                |                 | 5795        | 11.082                     | 11±1               | 12                          | 5.25               | 20                | 0.0106                                  |

**Note:**  
N<sub>TX</sub>= Number of Transmit Antennas  
RF Output power specifies that Maximum Conducted average Output Power.





**5. Conclusion:**

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

**Limits for General Population/ Uncontrolled Exposure**

| Frequency Range (MHz) | Power density (mW/ cm <sup>2</sup> ) |
|-----------------------|--------------------------------------|
| 300-1,500             | F/1500                               |
| 1,500-100,000         | 1.0                                  |

For:2402~2480MHz&2412~2462MHz&5180~5240MHz&5745~5825MHz

MPE limit S: 1mW/ cm<sup>2</sup>

The MPE is calculated as **0.0265mW / cm<sup>2</sup> < limit 1mW / cm<sup>2</sup>**.

Bluetooth Antenna1 + (2.4G&5G) WIFI Antenna1 support Synchronization transmit the

$$\sum \text{MPE}_{\text{ratios}} = 0.0019 + 0.0265 = 0.0284 < 1$$

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.

-----END OF THE REPORT-----

