

Radio Frequency Exposure Report

On Behalf of

HOBBYWING TECHNOLOGY CO.,LTD.

Building 4,Yasen Chuangxin Hi-tech Industrial Park,8 Chengxin Road,Baolong
Industrial Town, Longgang District, Shenzhen,P.R. China

Product Name: **Wifi express**
Model/Type No.: **HW313**
FCC ID: **2AIWP-HW313**
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	HOBBYWING TECHNOLOGY CO.,LTD.
Address of Applicant:	Building 4,Yasen Chuangxin Hi-tech Industrial Park,8 Chengxin Road,Baolong Industrial Town, Longgang District,Shenzhen,P.R. China.
Manufacturer 1:	HOBBYWING TECHNOLOGY CO.,LTD.
Address of manufacturer:	Building 4,Yasen Chuangxin Hi-tech Industrial Park,8 Chengxin Road,Baolong Industrial Town, Longgang District,Shenzhen,P.R. China.

General Description of E.U.T

Items	Description
EUT Description:	Wifi express
Model No.:	HW313
Supplementary Model:	N/A
Frequency Band:	IEEE 802.11b : 2412MHz~2462MHz; IEEE 802.11g : 2412MHz~2462MHz; IEEE 802.11n(HT20) : 2412MHz~2462MHz;
Channel Spacing:	IEEE 802.11b : 5MHz IEEE 802.11g : 5MHz IEEE 802.11n(HT20) : 5MHz
Number of Channels:	IEEE 802.11b :11 Channels; IEEE 802.11g :11 Channels; IEEE 802.11n(HT20) : 11 Channels;
Transmit Data Rate:	maximum of 150Mbps
Type of Modulation:	IEEE 802.11b: CCK IEEE 802.11g: OFDM IEEE 802.11n(HT20): OFDM
Hardware(HVIN):	HW313-YT2-V1.1
Firmware release(FVIN):	WF_HW313_V1.1_D0501.bin
Antenna Type:	Integral Antenna

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Objective

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1307

1.3 General Description of Test

Items	Description
EUT Frequency band	☐ FHSS: 2.400GHz ~ 2.483GHz ☒ WLAN: 2.400GHz ~ 2.483GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☐ Others: _____
Device category	☐ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☒ Others <u>Stationary type (>20cm separation)</u>
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²) ☐ Others: _____
Antenna diversity	☒ Single antenna ☐ Multiple antennas: ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	23.77dBm (0.238W)
Antenna gain (Max)	3dBi (Numeric gain:2.00)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation
Note: 1. The maximum output power is 23.77dBm at IEEE 802.11g mode 2462MHz (with 2.00 numeric antenna gain.) 2. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.	

1.4 Human Exposure Assessment Results

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field Strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = 100 * d (m)$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Equation 1

Where d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW / cm²

EUT parameter (data from the separate report)	
Given $E = \frac{\sqrt{30 \times P \times G}}{d} \text{ \& \& } S = \frac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Max average output power in Watt (TP)	23.77dBm (0.238W)
Antenna gain (G)	3dBi (Numeric gain:2.00)
Exposure classification	S=1mW/cm ²
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)

Yields

$$S = \frac{30 \times P \times G}{3770 d^2}, \quad P=0.238W, G=2.00, d=0.2$$

$$S=0.095\text{mW/cm}^2$$

Or

$$d = \sqrt{\frac{30 \times P \times G}{3770 S}}, \quad S=1, P=0.238W, G=2.00$$

$$d=0.0615\text{m}$$

Conclusion:

$S=0.095\text{mW/cm}^2$ is significant lower than the General Population Exposure Power Density Limit 1mW/cm^2 or except the distance when human body proximity to the antenna is less than 3.00cm then will reach the General Population Exposure Power Density Limit

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)

